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# THE METHODS OF THE SAVINGS SURVEY

Although there is a growing literature on the technique of sample surveys, detailed reports on the inner workings of particular surveys are comparatively rare. Where the technique employed follows a simple or well-worn pattern there is, of course, no need for lengthy description. This survey, however, was exceptional in several respects; and the story of its planning and execution may be of interest to many engaged in, or contemplating, investigations in the broad field of social and economic affairs.

In writing this article I have also had in mind that it is the duty of those who publish statistical material to give an account, for the benefit of potential users of the information, of how the data were collected, in what form they were first recorded and of the various processes through which they passed before they emerged before the public eye. Few, if any, economic statistics are entirely reliable: where the human agency is at work there are bound to be misunderstandings and mistakes. It is the task of the statistician to assess the importance of the various causes of error and to interpret the figures at his disposal in the light of this assessment. To perform his function adequately he must be acquainted as fully as possible with the methods by which the data were compiled.

## Defining the Purpose of the Survey

In the textbooks, emphasis is rightly laid on the importance, at the outset of planning any survey, of defining its purpose. This is often a tedious and brain-twisting task; and there is a strong temptation to pass it over as lightly as possible. But it has been proved many times that any fault or oversight in the opening stages of a survey has magnified repercussions in the later stages. It is usually impossible to forsee every problem; but the more that are foreseen the better.

The aims of this inquiry were twofold: it was firstly required as a means of filling some well-known gaps in our economic statistics, and especially to provide estimates of the distribution of liquid assets amongst persons and of the volume of personal saving and its relation to personal income. On this side of the survey, the emphasis was on the description of the behaviour and characteristics of the population. The second aim, which flowed naturally from the first, was to collect data for an analytical treatment of the problem of personal saving. In this part, the methods of mathematical statistics would be brought to the aid of an informed judgement in order to distinguish, and to measure the importance of, the various factors determining saving behaviour.

For both these purposes it was necessary to collect the same central group of facts, notably the liquid asset holdings and saving of each unit of the population. It was also essential to record various social, or socio-economic, characteristics of the people interviewed, such as their age, sex, marital status, occupation, industry and number of dependent children. For both purposes it was desirable to know each person's income; and there were obvious advantages in ascertaining the housing tenure of the persons interviewed and their ownership of and expenditure on the purchase of durable goods.

These purposes determined the plan of the survey. From them flowed ultimately all subsequent decisions, on the sampling unit, on the sample design, on the questions to be asked, on the tabulating methods and on innumerable other matters. The entire plan was interlocking and carefully balanced: considerations of convenience of interviewing, coding, editing and tabulating had each to be taken into account in drawing up the questionnaire; while problems of accuracy were weighed against cost both in the design of the sample and in the method of tabulation.

## THE ORGANISATION OF THE WORK

This project was initiated as part of the research programme of the Oxford University Institute of Statistics, and it was the first of its kind to be undertaken in this country. It was well recognised that we were attempting to collect information on an unusually difficult subject, about which many people might be expected to be somewhat reticent, to say the least. Advice was sought from various quarters and the fullest use was made of the experience of the Survey Research Center of the University of Michigan, who are responsible—as agents of the Federal Reserve Board—for the Surveys of Consumer Finances in the United States.

In order to test the reaction of the people of this country to questions about their personal finances, and at the same time to gain some insight into the distributions of the variables in which we were interested, we decided to make a small pilot survey. This was carried out in the City of Oxford in the spring of 1951: a sample of about 400 people were interviewed and the results were encouraging.[1] On this basis, we were able to proceed to the planning of a national survey.

A local survey can easily be undertaken with a small group of specially-selected interviewers. In the Oxford pilot survey most of the interviewers were people connected in some way with the University, although undergraduates were not employed. For a national survey, however, it is necessary to have at one's disposal a force of fieldworkers spread over all parts of the country. Moreover, the administrative side of a national survey is on a correspondingly large scale: the drawing of the sample alone is a large and complicated business, and the organisation and control of interviewers, coders and the people engaged in the operation of punched-card machinery requires an experienced headquarters staff.

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[1] A description of the methods used in the Oxford survey, and of its results, can be found in a series of articles in the BULLETIN. See the following issues: September, 1951; November–December, 1951; March, 1952; and July, 1952.

To assist us in all these matters we turned to the Social Survey, an expert organisation, established and maintained by the government for the purpose of carrying out sample surveys. The Social Survey were allowed to give us the benefit of their 'technical advice and assistance' in all aspects of the work. Their co-operation was extremely valuable to us: the sample was drawn according to their design and under their supervision; the questionnaire found its final shape in their hands; and the complicated scheme of tabulations was the product of their ingenuity. Moreover, we were very fortunately able to employ some of the Social Survey's interviewers.

While the Social Survey supplied indispensable assistance in all these ways, the Institute remained responsible for the general lines of the survey and of the sample design, for determining the content of the questionnaire, for deciding what tables should be produced and for the analysis and publication of the results. In addition, one of the vital processes—the so-called 'editing' of the forms— was carried out at the Institute. The object of this process, and the work that it involved, will be described in its proper place below.

The problems encountered in the planning and execution of the survey, and the methods by which they were resolved, will be outlined in the following order: first, the design of the sample and the methods used in drawing the sample; second, the information required and the design of the questionnaire; and third, operational procedure, including fieldwork, editing, coding, and tabulation. The article will conclude with a discussion of the reliability of the results, in the course of which some information will be given about sampling errors.

## The Sample Design

### *The Elementary Unit*

Before one can begin to design a sample, it is necessary to define the elementary unit whose characteristics are to be measured. The elementary unit is that unit for which information is required in the form of frequency distributions, means, standard deviations and so on. It is not necessarily a unit which is used in any of the actual stages of sampling, since elementary units need not be selected individually but are frequently chosen in 'clusters'. For example, in a survey in which it is desired to measure the characteristics of individual persons the sample may be drawn as a sample of households, all the persons in each household being included as a cluster.

In this survey the elementary units were to consist, so far as possible, of groups of people of such a type that each was governed by a single will in the allocation of its resources. These resources would be the group's pre-existing stock of assets, plus income received during the year; and the possible uses would be expenditure on consumption and additions to assets. Clearly, therefore, the elementary unit should be a group of persons who could be expected to pool their incomes and their assets, and to arrive at a common understanding about the use to be made of these resources in any given period of time.

No objectively definable group of persons conforms exactly to these criteria : the range of variation in human behaviour is extremely wide. But the nearest approximation, under the conditions of family life existing in Britain to-day, seemed to be that group which we call the ' income unit '. It consists either of a single person, aged 18 or over, or of a married couple —children of under 18 being attached to their parents or guardians. The income unit, as thus defined, is often identical with a complete household; but households which contain more than one married couple, or a married couple plus one or more single persons, or several single persons, contain several income units.

### *Coverage of the Survey*

Another question that needed early decision was the delimitation of the population to be covered by the survey. In this country, whose boundaries vary disconcertingly between one statistical series and another, the first aspect of coverage that has to be determined is the geographical one. Ideally, all our national economic information should relate to the same area : and, for preference, that area should be the United Kingdom of Great Britain and Northern Ireland. However, the field force at our disposal in this survey did not cover Northern Ireland; and the cost of sending interviewers there, or recruiting them specially for the survey, would have been heavy. So it was decided to limit the survey to Great Britain. The population of Northern Ireland, thus excluded, amounted in June 1952 to about 1,375,000, or some 2.75 per cent of the population of the United Kingdom.

The next problem of coverage was to decide whether to give all the elementary units in the population a chance of being chosen for the sample. Here again the ideal was that the survey should have the maximum coverage; but practical difficulties led to certain exclusions. For reasons which will be explained below, the sampling units drawn in the final stage of sampling in this inquiry were ' rateable units ' of property. These rateable units, which are identified by the fact that they are premises which are separately assessed for local rates, vary in size from small houses and flats occupied by one or two income units to hotels, colleges, hospitals and other large institutions containing dozens, or even hundreds, of income units. The procedure followed in making interviews in private dwelling-houses was, generally speaking, to include in the sample the entire cluster of income units found there; but it would have been quite impracticable, and indeed undesirable from the point of view of sampling precision, to have tried to interview the whole group of inhabitants of an institution. The best alternative would have been to list all institutions separately and to apply a different sampling procedure to them, so that not more than one or two interviews had to be made in each institution. But this would have been a difficult and expensive operation; and, in any case, the chances of obtaining successful interviews with people living in institutions were considered questionable.

It was therefore decided to limit the coverage of the survey to income units living in private households. A private household is one which makes its own housekeeping arrangements: it may include boarders, but, by an arbitrary rule, households which contained more than three boarders were treated as commercial boarding-houses. At hotels, public houses and commercial boarding-houses the income unit to which the resident proprietor or manager belonged was included in the sample, but neither the guests nor the staff were interviewed. No interviews at all were made at hospitals, boarding-schools, prisons, hostels or other institutions.

In sum, the population covered by this survey comprised the income units living in private households in Great Britain. At the time of the 1951 Census the population of institutions in Great Britain amounted to about 2½ million. Hence the total exclusions from the survey coverage, for Northern Ireland and the institutions combined, represented somewhat less than 4 million out of the total population of the United Kingdom of over 50 million.

### *General Principles of Design*

The general objective of sample design is to provide the maximum of precision for the minimum of cost. The precision, or reliability, of a sample is inversely related to its sampling error: the greater the sampling error, the less the precision of the sample estimates, and *viceversa*. Hence, the aim of sample design can be regarded as being either (*a*) to achieve a sampling error of given size for the least possible cost, or (*b*) to achieve the least possible sampling error for a given cost. In most sample surveys it is desired to obtain estimates of several different kinds—means, medians, proportions and so on—for several different attributes or variables. A design which is most efficient for one purpose will not always be that which is most efficient for the others; and it is usually necessary to make a choice between possible designs so as to achieve the best all-round results.

If all interviews were of equal cost the problem of sample design would be comparatively easily solved. The most efficient design would almost always be that in which the largest number of elementary units was chosen directly and at random, subject to ultimate limitations of cost. The precision of such a sample might well be improved by suitable stratification; but even in a stratified sample the elementary units would continue to be selected directly, *in one stage*. To carry out such a one-stage sample it would be necessary to have a complete list of the elementary units in the population. We are fortunate in having in this country a more or less complete list of the adult population in the form of the Electoral Register, which could be used for drawing a one-stage sample of the population. But the Electoral Register is never, in fact, used in this way, since the list of addresses drawn from it in a random sample of the whole population of Great Britain would be very widely scattered and the interviewing costs would be extremely high.

The point is that the cost per interview is, generally speaking, never constant. If, for example, it had already been arranged to make a certain number of interviews in specified towns, the cost of adding extra interviews to the sample would usually be much greater if the extra interviews were to be made in new towns than if they were simply to be added to the quotas of the existing towns. It is usually necessary to have a different interviewer in each town; and each additional interviewer involves an extra overhead cost of briefing and training. Also the drawing of a sample in a new town generally entails special expense, whereas the cost of drawing extra units in towns where a sample is already being drawn is negligible. Hence, the addition of interviews by extending the number of towns is almost always more costly than the addition of interviews by increasing the number to be made in existing towns.

As a consequence of these considerations, the normal practice in all surveys is that the sample is drawn in several stages. At the first stage a sample of towns or districts is chosen from a complete list of all towns and districts; and within each town or district there are further stages of sampling. Since there are in this country effective lists of addresses within towns and districts, from which individual addresses or rateable units can be selected, it is not usually necessary to go beyond a second stage of sampling.

One of the chief problems of sample design in multi-stage samples is to determine the optimum number of first-stage units (*i.e.*, towns or districts) to be selected. For a given total number of interviews, the larger the number of first-stage units employed the greater, in almost all cases, the precision of the sample estimates. At the same time, as has been shown, an extension of the number of first-stage units increases the cost of the survey, even when the total number of interviews remains constant. An exact solution of this problem can be reached only on the basis of accurate information about the relative costs of extending the sample in different ways and of the relative variability of first- and second-stage sampling units. To take an extreme example, if all first-stage units were identical in structure, their variability would be zero and there would be no advantage in taking more than one of them in the sample : hence, the desired information could best be obtained by making all the interviews in a single town or district. At the other extreme, if all the second-stage units (*e.g.* households) within each town were identical, there would be no advantage in taking more than one household from each town, and the best procedure would be to extend the number of towns sampled as far as cost would allow. Actual conditions fall somewhere in between these two extremes. There is always some variability *between* towns and *within* towns ; and the most efficient sample design depends on the relation between these two sources of variation.[1]

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[1] For a fuller discussion of this problem, and of other technical aspects of sampling, reference may be made to :

[*Footnote continued on p. 203*

*The First Stage of Sampling*

The type of sampling unit used at the first-stage of sampling is largely determined by the nature of the lists that are to be employed in sampling at the second stage. If the Electoral Register were to be used at the second stage it would be natural to take constituencies, wards or polling districts as the first-stage units. Since, in this survey, it had been decided to sample rateable units of property at the second stage, it followed that the units to be sampled at the first stage should be districts covered by separate rating authorities.

The authorities responsible for compiling Valuation Lists in England and Wales are the county and other borough councils, and the urban and rural district councils. In Scotland the rating authorities are the counties and large burghs. The total number of rating authorities in Great Britain is in excess of 1,500, and their populations vary widely in size and in other respects. At one end of the scale—as can be seen from Table 1—there are six authorities with populations of half a million or more. These great towns—Glasgow, Birmingham, Liverpool, Manchester, Sheffield and Leeds—embrace between them over 4½ million people, or nearly 10 per cent of the population of Great Britain. At the other extreme are 214 urban and rural districts, each covering less than 5,000 people, whose aggregate population amounts to less than 2 per cent of the total. Amongst them are such places as the Rural District of Tintwistle in Cheshire, whose population at the 1951 Census was 1,362, or the Municipal Borough of Bishop's Castle in Shropshire, with a population of only 1,291; while in Wales there are four authorities covering populations of less than 1,000 each.

In view of the great variability in the first-stage units, it is desirable either to stratify them or to group them into heterogeneous clusters. Stratification is the process of dividing up the population into groups which are expected to be reasonably homogeneous. Its purpose is to reduce the average variance (square of the standard deviation) in each group compared with the variance of the population: its effect, if successful, is to produce an equivalent reduction in the variance of estimates derived from the sample. Grouping the units into clusters can be helpful if it produces greater homogeneity *between* the clusters: for example, large and small units might be grouped together so as to create clusters containing approximately equal populations; or rural districts could be bound up with metropolitan areas so as to make each cluster a more representative microcosm of the whole country. It is generally true, however, that when there is sufficient knowledge of the characteristics of the sampling units to make possible the formation of 'representative' clusters, the same knowledge can be used with greater

M. H. Hansen, W. N. Hurwitz and W. G. Madow, *Sample Survey Methods and Theory*, Vols. I and II, 1953.

F. Yates, *Sampling Methods for Censuses and Surveys*, Second Edition, 1953.

P. G. Gray and T. Corlett, 'Sampling for the Social Survey', *Journal of the Royal Statistical Society*, Part II, 1950.

In the following sections, I have drawn freely on the many valuable ideas developed in these works. My indebtedness to the important paper by Gray and Corlett is especially great.

effect for purposes of stratification. The method of clustering, therefore, is usually employed only when the opportunities for stratification have been exhausted, as, for example, when the number of strata is already equal to the number of sampling units to be selected. In such a case, if more sampling units were being drawn it would be possible to use the additional information for further stratification; but since it cannot be so used it may still be employed for the purpose of producing ' representative ' clusters within each stratum.

In this survey it was decided to aim at a final sample of income units, successfully interviewed, of about 2,500. It has been found from experience at the Social Survey that the most efficient distribution of interviews in a sample of this size is generally one in which each interviewer has between 30 and 40 interviews to complete. This implies a sample of first-stage units in the region of 60 to 80. In fact, in this survey, the number of first-stage units selected was 69. It was further decided that the stratification of the first-stage units should be carried to its fullest possible extent, *i.e.*, that the number of strata should be equal to the number of first-stage units selected. The advantage of this procedure is that the greatest possible use is made of prior information in order to improve the precision of the sample; but it carries with it, as we shall see, the disadvantage that, since only one unit is taken from each stratum, the sampling errors of these estimates cannot be accurately determined. However, where a choice lies between improving the precision of the estimates derived from a sample or of the estimates of the sampling errors of those estimates, it seems clear that the former alternative should be taken.

The next step was to determine what methods of stratification should be employed. It will be recalled that the purpose of stratification is to group the sampling units in ways which will reduce the variance within each group below the variance of the population as a whole. Thus, the problem in this case was to classify the 1,526 rating authorities in Great Britain into 69 groups which would each be as homogeneous as possible in respect of the principal variables with which we were concerned. One restraint on the freedom of grouping was that each stratum should contain approximately the same number of ultimate units—in this case, income units—since the number of interviews to be made in each district was to be approximately the same.

The actual methods of stratification employed were as follows : firstly, the rating authorities were grouped into 12 regions, corresponding approximately to the standard regions. One of these—the Greater London Conurbation—was further subdivided into three sub-regions, consisting of (i) the north-west zone, (ii) the north-east zone and (iii) the southern zone. Secondly, within each region the rating authorities were divided into urban and rural, or—in the case of Scotland—into large burghs and counties. The rural districts are, of course, those which are so described in their official title : they are not always particularly rural in respect of the occupations—or other characteristics—of their inhabitants.

The third—and final—stage of stratification was carried out in various ways. In most parts of England and Wales, areas were classified according to the Social Survey's ' industrialisation index ', which is a measure, for each rating authority, of the ratio of the combined rateable value of all industrial hereditaments in the area to the total rateable value of the area. This provides a rough indication of the degree of industrialisation of the area; and the Social Survey have found a significant correlation, for areas outside London, between their industrialisation index and the proportion of the population who are in the highest income group (and inside London between rateable value per head and the same economic characteristic). In this survey, we have not found very strong evidence of association between the industrialisation index and such variables as the mean income, asset holdings and saving of income units. But, of course, any method of stratification of the first-stage units which reduces their variability within strata—even by a small amount—is very useful, since it can be done at insignificant cost.

In Greater London, the third stage of stratification was made with reference to ' other rateable value per head.' This figure is obtained when the total rateable value of hereditaments other than industrial and freight-transport hereditaments—*i.e.*, mainly residential and commercial property—is divided by the population of the area. Finally, the Scottish Counties were stratified by population per acre; and the large burghs of Scotland and certain large towns in England were stratified by population size.

TABLE 1
*Distribution of Rating Authorities by Population*

| *Population at 1951 Census* | *England and Wales* | | *Scotland* | *Total for Great Britain* |
|---|---|---|---|---|
| | *Borough and Urban Districts* | *Rural Districts* | *Counties and Large Burghs* | |
| Under 5,000 ... ... | 182 | 32 | — | 214 |
| 5,000— ... ... | 185 | 104 | 2 | 291 |
| 10,000— ... ... | 213 | 188 | 5 | 406 |
| 20,000— ... ... | 109 | 91 | 11 | 211 |
| 30,000— ... ... | 70 | 39 | 5 | 114 |
| 40,000— ... ... | 54 | 17 | 10 | 81 |
| 50,000— ... ... | 101 | 6 | 14 | 121 |
| 100,000— ... ... | 64 | — | 7 | 71 |
| 250,000— ... ... | 9 | — | 2 | 11 |
| 500,000 and over ... | 5 | — | 1 | 6 |
| Total ... ... ... | 992 | 477 | 57 | 1,526 |

It might have been thought that, in view of the striking variations in population size of the first-stage units, as indicated by Table 1, it would be essential to use population size as one of the stratifying factors in all cases. It has been shown, however, that this can be avoided by the simple technique of sampling with ' probability proportionate to size '. Within each stratum of first-stage units, instead of choosing, say, one unit at random, each unit being given an equal probability of selection, the units are weighted according to some measure of their size, preferably one which is closely related to the number of elementary units they contain, and the probability of selection of a particular unit is then governed by its relative weight. If, for example, a stratum contained 5 units with a population of 100 each and 50 units with a population of 20 each, selection with equal probabilities would give each of the 50 small units an equal chance of selection to each of the 5 large units. The sample would not be biased but it would be subject to a large sampling error. If, on the other hand, the sample were chosen in such a way as to give each large unit—containing 100 people—five times as great a chance of being selected as a small unit—containing only 20 people—the effect would be to reduce the sampling error very considerably. By the first method, one would expect to obtain in any sample one large unit to every 10 small units; by the second method, the expectation would be one large unit to every two of the small. This difference in probability of selection would, of course, have to be taken into account in compiling estimates from such a sample: and an automatic system of weighting can be obtained by using probabilities of selection of second-stage units which are inversely proportional to the first-stage probabilities. This was the procedure used in this survey.

When the population of Great Britain is divided into 69 strata of approximately equal size, some rating areas are so large as to occupy an entire stratum to themselves. The average number of people per stratum is about 700,000; and the four towns—Birmingham, Glasgow, Liverpool and Manchester—each of which is an independent rating area with a population exceeding 700,000, were taken automatically for the sample. In addition it was found convenient to include the City of Edinburgh on its own, although its population is somewhat less than half a million. The remaining rating areas were grouped into 64 further strata, with total populations ranging from 533,000 to 1,105,000. The number of rating areas included in each stratum varied quite widely. Apart from the five one-town strata, there were three strata in England consisting of two towns, and three of the Scottish strata contained five units or less. The majority of the strata, however, contained at least 20 rating areas.

To summarise the procedure: the 1,526 rating areas of Great Britain were grouped into 69 strata; five of these were single towns so large as to occupy a complete stratum; the other 64 were groups of rating areas which had been stratified by region, by whether they were urban or rural areas, and by some further factor such as the ‘ industrialisation index ’. Within each of these 64 strata one rating area was chosen at random, each area being given a probability of selection proportionate to its population.

### *The Second Stage of Sampling*

The purpose of sampling at the second stage is to obtain as precise estimates as possible of the characteristics of the first-stage units. In so far as the first-stage units vary amongst themselves—within each first-stage stratum—there will inevitably be some sampling error in making estimates from a sample of first-stage units. This would be so even if a full count were made of the population within each first-stage unit. If, in fact, a full count is not made, and the parameters (*e.g.*, the means) of the first-stage units are estimated by sampling within the first-stage units, there will be a further contribution to the total sampling error. In other words, the variance of *estimates* of the means of the first-stage units is added to the variance of those means themselves and there are thus two causes of variance in the final sample estimates. It is obviously of some importance, therefore, to reduce as far as possible the second-stage contribution to the total sampling variance. This again, may be achieved by the methods of stratification and of clustering of the second-stage units, already described in the discussion of the first stage of sampling.

There are two lists of the population, or of dwellinghouses, which can be adapted for drawing samples of income units within towns and other areas. The first is the Electoral Register, which gives the names and addresses of all adult persons registered as eligible to vote. The second is the list of rateable property kept by each local rating authority. Neither of these is a list of income units as such, but their easy availability more than compensates for this defect. Moreover, both lists offer certain opportunities of stratification of the sampling units. In the case of the Electoral Register, it has been shown that both areas and individual persons can be stratified by reference to the incidence of the juror qualification.[1] In the case of the rating list, units of property may be stratified by their rateable values.

At the time of this survey, the methods of stratification by reference to the juror qualification had not been fully developed, and it was considered that the rating lists would provide the most useful frame for sampling at the second stage. Experience in the Oxford pilot survey had shown that some improvement in the precision of estimation could be achieved if a sample of rateable units was drawn after stratification by rateable value. Moreover, an even greater gain in precision was obtainable if, instead of selecting rateable units from within strata with equal probability, each stratum was given a different probability of selection, depending on the variance of the population within that stratum. The theory of this technique, known as 'stratified sampling with variable sampling fraction', was developed by Neyman, who showed that the maximum improvement in the precision of estimation of the mean of any variable can be obtained if the sampling fraction employed within each stratum is proportionate to the standard deviation of the variable within that stratum. Thus, if the sampling fractions within strata are denoted by $f_1, f_2, \ldots$ and the standard deviations within strata by $\sigma_1, \sigma_2, \ldots$ the optimum allocation of the sample between strata is obtained where

$$\frac{f_1}{\sigma_1} = \frac{f_2}{\sigma_2} = \ldots$$

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[1] See P. G. Gray, T. Corlett and P. Jones: 'The Proportion of Jurors as an Index of the Economic Status of a District', published by the Social Survey, London, 1951.

The effectiveness of stratification as such depends on the possibility of grouping together units of the population into strata which are more internally homogeneous than the population as a whole. When the units can be stratified by some criterion which achieves this object the within-strata standard deviations may all be reduced very considerably. But even if efficient means of stratification in this sense are lacking something can be gained if it is possible at least to separate off one or more fairly homogeneous strata, containing the bulk of the population, and isolate a residual of more variable composition. Then estimates of the characteristics of the relatively homogeneous strata can be made with a sufficient degree of reliability on the basis of a less than proportionate sample and greater efforts can be concentrated on obtaining reliable estimates of the characteristics of the heterogeneous stratum.

From the results of the Oxford pilot survey it was known that the principal variables under study in this survey tend to vary more widely amongst people living in large (or more highly-rated) houses than amongst those living in small (low-rated) houses. For example, people living in small houses rarely have very large incomes or liquid assets; in other words, the small houses constitute a fairly homogeneous stratum. On the other hand, people living in large houses show considerable variations in their incomes and asset holdings. This is mainly because highly-rated houses are of two types : those which are occupied by only one household, whose income is usually on a correspondingly high level, and those which are occupied by several poorer households. The latter class of houses often contains the older ones in the centre of the town, which are used as lodging-houses or are partially broken up into flats.

TABLE 2

*Means and Standard Deviations of Three Principal Variables, shown in Relation to Rateable Value*[1]

| *Rateable value of dwellings*[2] | *Gross income* | | *Liquid assets* | | *Saving* | | *Number of income units in sample* |
|---|---|---|---|---|---|---|---|
| | *Mean* £ | *S.D.* £ | *Mean* £ | *S.D.* £ | *Mean* £ | *S.D.* £ | |
| Under £5 ... | 282 | 209 | 84 | 212 | + 9 | 66 | 64 |
| £5—9 ... ... | 356 | 745 | 172 | 1,323 | +12 | 173 | 452 |
| £10—14... ... | 360 | 198 | 123 | 350 | — 3 | 92 | 482 |
| £15—19... ... | 413 | 315 | 165 | 497 | +11 | 145 | 299 |
| £20—29... ... | 444 | 349 | 263 | 775 | + 3 | 93 | 300 |
| £30—39... ... | 515 | 506 | 423 | 965 | + 7 | 170 | 497 |
| £40—49... ... | 697 | 796 | 617 | 1,154 | — 9 | 313 | 217 |
| £50—59... ... | 787 | 1,145 | 688 | 1,341 | + 6 | 534 | 105 |
| £60 and over ... | 983 | 1,837 | 760 | 1,446 | —53 | 478 | 182 |
| Under £30 ... | 383 | 459 | 171 | 843 | + 6 | 130 | 1,597 |
| £30 and over ... | 611 | 1,069 | 558 | 1,177 | — 8 | 329 | 1,001 |
| All dwellings ... | 424 | 584 | 225 | 893 | + 4 | 172 | 2,598 |

[1] The means and standard deviations relate to the income, etc., of income units living in dwellings of the specified rateable values.

[2] The rateable value of a dwelling is its gross value less the statutory deductions allowed for repairs and maintenance. In England and Wales rateable values are stated in the rating lists to the nearest £ ; in Scotland they are often stated to the nearest 5s. or 10s. In the above table the Scottish rateable values are rounded downwards to the nearest £. Strictly, therefore, the class boundaries of some of the classes given above are slightly different for Scottish dwellings from those appropriate to dwellings in England and Wales.

Some impression of the relative variability of economic characteristics within different classes of houses can be obtained from the figures of Table 2. These show the means and standard deviations of gross income, liquid asset holdings and total saving of income units living in houses of different rateable value groups.

Since the figures are derived from the sample itself, they are subject to sampling error; moreover, they are not exactly in the form required. For, in the first place, they give the aggregate results for all the first-stage units, pooled together, and to that extent they probably over-estimate the standard deviations that would apply within each first-stage unit. Secondly, they are based on individual income units when, in fact, the sample was drawn in the form of clusters of income units, each cluster consisting of all the income units (up to a maximum of three households) in a separately rated dwelling. The relevant comparison is between the standard deviations of the means of clusters, drawn from dwellings of different rateable values. Since there is some tendency for rich people in large houses to have poorer relatives and servants living in the same house with them, the standard deviations between the means of clusters may be less than the standard deviations of the individual income units, when taken without regard to their arrangement in clusters. Neither of these factors, however, is likely to be so important as to alter appreciably the differences between the standard deviations shown in Table 2.

On the basis of the Oxford results, and having regard to the practical objections to the employment of an over-complicated sampling technique, we decided to divide the rateable units in all areas into two strata—those with rateable values of less than £30, and those with rateable values of £30 and over—and to give each rateable unit in the upper stratum a probability of selection equal to five times the probability employed in selecting those in the lower stratum. This multiple was chosen after making due allowance for the likelihood of obtaining a lower response rate in the upper stratum than in the lower stratum. In fact, the difference between the average response rates in the two strata was such as to reduce the effective relative probabilities of selection to the ratio of 3.7 to 1. Even so, this gives more weight to the upper stratum than would be strictly desirable according to the Neyman criterion. As things turned out, the relative standard deviations in the two strata were about 2½ to 1 for gross income, 1½ to 1 for liquid assets and 2½ to 1 for saving. From this point of view it would have been better to have had more than two strata, whose limits would have varied in different areas, and to have employed several different sampling rates. But this would have made both the drawing of the sample and the weighting of the results much more complicated than they were already and, for this reason, it might not have been an economically efficient method of improving the precision of our estimates.

The Neyman criterion is not, in fact, the only relevant one in this case. One of the important aims of the survey was to analyse the behaviour of different sub-groups of the population. In economic studies it is often useful to classify the population by reference to their income; and we wanted to have in our sample enough people with large incomes to be able to compare their behaviour with the behaviour of others. The decision as to what is meant by a ' large ' income and how many of them it would be desirable to have in the sample, was exceedingly difficult; but we were able to use the Oxford pilot results as a guide, both to the proportion of large incomes that would be found in each stratum, and to the variability of the behaviour of such people. It was only after a careful consideration of all these factors that the actual sampling rates were chosen. In the outcome, the effect of the differential sampling rates employed was to increase quite considerably the number of income units with large incomes who were included in the sample.

TABLE 3

*The Effect of Using Variable Sampling Rates on the Number of Upper Income Units Selected*

| | *Total number of income units in sample* | *Those with incomes of £1,000 and over* | |
|---|---|---|---|
| | | *Number* | *Per cent of total* |
| Upper stratum : rateable value £30 and over... | 1,001 | 162 | 16.2 |
| Lower stratum : rateable value under £30 ... | 1,597 | 33 | 2.1 |
| Total (unweighted) ... ... ... ... | 2,598 | 195 | 7.5 |
| Total (from a proportionate sample of the same total size) ... ... ... ... ... | 2,598 | 104 | 4.0 |

In a total sample of 2,598 income units successfully interviewed, there were 195 units with a gross income of £1,000 a year and over. As can be seen from the figures in Table 3, 162 of these came from the upper stratum and only 33 from the lower stratum. From a sample of the same total size—but drawn at a constant sampling rate from each stratum—the number of income units with incomes of £1,000 and over would have been only 104.

We may conclude that, from the point of view of increasing the number of upper income group income units, the method of sampling employed was reasonably—though not outstandingly—successful. Even after stratification by rateable value, the houses with rateable values of £30 and over contained only 16 per cent of income units with incomes of £1,000 a year and over. If the dividing line had been taken at a rateable value of £40, or at any other level above that, the upper stratum would still have contained only about 20 per cent of income units in this range of income. It is clear, therefore, that stratification by rateable value is not an ideal method, though it is better to use this method of stratification than none at all. Experiments are being made with the use of the juror qualification as a means of stratification, both at the first and at the second stage of sampling, and it seems probable that this method will prove somewhat more efficient.

## THE PROCEDURE FOLLOWED IN DRAWING THE SAMPLE

The selection of the first-stage units was carried out by officers of the Social Survey at their headquarters. The methods by which the rating authorities were stratified prior to sampling have already been described. Apart from the five large towns which were automatically included in the sample, the remainder of the rating authorities were grouped into 64 strata, each containing two or more authorities. Within each stratum the authorities were then arranged in any convenient order and their populations were cumulated. Each authority was thus associated with that part of the cumulative scale which was covered by its population. A number was selected at random—with the help of a table of random numbers—and the authority within whose part of the cumulative scale the number fell was thereby chosen for the sample. One authority in the South of England, which was originally selected for the sample, subsequently refused to allow access to its rating records; and it became necessary to draw a new town from the same stratum to replace it.

The next step was to allocate the number of rateable units to be drawn from each area. It had been decided to draw a total sample of approximately 2,500 rateable units, and these were to be distributed amongst the 69 rating authorities in such a way as to give each stratum its proper representation in the total. In other words, it was intended that, apart from the deliberate over-sampling of houses rated at £30 and over, each rateable unit in the country should have an equal ultimate chance of selection. Although the number of rateable units of dwelling property in each first-stage stratum was not known exactly, it was possible to estimate this by reference to the total population of the stratum, in conjunction with estimates—derived from experience in previous surveys—of the number of persons per rateable unit in different areas.

Although the method of allocating the 2,500 rateable units amongst the first stage units was, in principle, quite simple, it is not easy to explain. It must be remembered that it had been decided to give dwellings with a rateable value of £30 and over five times as great a probability of selection as those valued at less than £30. Consequently, the number of rateable units to be drawn in each area could not be determined directly by the total number of rateable units in the area but depended in part on the proportion of upper stratum rateable units in that total.

The drawing of the sample of rateable units may be regarded as a process of ' two-phase ' sampling. In the first phase, a large sample of rateable units was drawn, inspected and classified into two strata according to rateable value. This first sample provided an estimate of the relative proportions of the two strata in the population. In the second phase of sampling, a sample of one in five rateable units was drawn from the lower stratum and the other four-fifths were discarded. All the rateable units in the upper stratum were retained.

Now, if at the end of this two-phase sampling process there are to be 2,500 rateable units in the final sample, the number of rateable units selected in the first phase can be discovered from the formula.

$$N\left(\frac{p_1}{5} + p_2\right) = 2500$$

where $N$ is the number of rateable units drawn in the first phase and $p_1$ and $p_2$ are the proportions of lower and upper stratum rateable units in the population. For the country as a whole the value of $p_2$ was estimated to be 13 per cent. If the first-stage areas actually drawn for the survey were representative of the whole country in this respect $N$ would be equal to 8224.

It was decided to allocate this number of rateable units amongst the 69 towns and districts in proportion to the estimated number of rateable units of dwelling property in the strata (*i.e.*, groups of first-stage units) from which the areas were originally drawn. Thus each area obtained its quota of dwellings to be drawn in the first phase of sampling of the rating list. The rate of sampling in each area was fixed at such a level as to yield at least this quota of dwellings in the first phase. If more than sufficient dwellings were drawn, some were discarded at random. Amongst the dwellings rated at less than £30, four out of five were rejected and the remainder of this stratum, together with the whole of the original sample of dwellings rated at £30 and over, constituted the final sample list.

It will be seen that the number of dwellings included on the final sample list for each area depended on two factors: first, the number of dwellings estimated to exist in the stratum of rating authorities from which the area itself was drawn; and secondly, the proportion of dwellings rated at £30 and over actually found in that area. This latter proportion varied widely from one area to another: in two areas it was less than one per cent, in one area nearly 75 per cent. As a consequence, the number of rateable units drawn for the final sample ranged from less than 20 in one area to over 100 in another area. In 48 areas, however, the number of rateable units in the sample was between 20 and 39.

Before the sample of rateable units in each area could be drawn it was necessary to ask the Town Clerk—or other appropriate officer—to allow access to the rating records. This permission was granted, in all cases except one, and arrangements were made for interviewers to go and draw the samples. The interviewers were given precise written instructions on how to proceed. They were to make use either of the Valuation List itself or of the Rate Books, choosing whichever set of records was most up-to-date; and they were to ensure that whatever records were used covered all the dwelling property in the area. They were to count through the list, taking the books in any order, and record the assessment number of every *kth* item of property. The value of $k$ was specified separately for each area, and the position of the first item recorded was taken at random from within the range of 1 to $k$. These assessment numbers were recorded on tally-sheets which consisted of rows of squares, each fifth square being specially marked. If the number fell on an unmarked square the interviewer was obliged to look at the rateable value of the property and she proceeded to record the item on her sampling list only if the rateable value was £30 or more. When the number fell on a marked square, however, the item was recorded on the sampling list irrespective of its rateable value.

The information recorded for each property on the final sampling list was as follows: the assessment number, full address of property, postal district number (if any), ward or parish, description of property and rateable value. All types of property were included at this stage, irrespective of whether they were dwellings or not; but when the lists were received at headquarters, those properties that clearly did not include any dwelling accommodation, according to their description, were taken off the list. When the interviewers went out into the field, they found that a few of the properties on their lists contained no dwelling accommodation; but the effect of this slight distortion of the sample is not serious.

## The Information Required and the Questionnaire

In order to satisfy the purposes of the survey it was necessary to collect the following principal types of information about each income unit:

(1) Total income in the past year, before tax.

(2) Enough information about the family circumstances of the income unit to be able to estimate the amount of income tax, surtax and national insurance payment due. Hence to arrive at income after tax.

(3) The volume of saving in the past year, to be estimated by collecting information on all types of capital transactions.

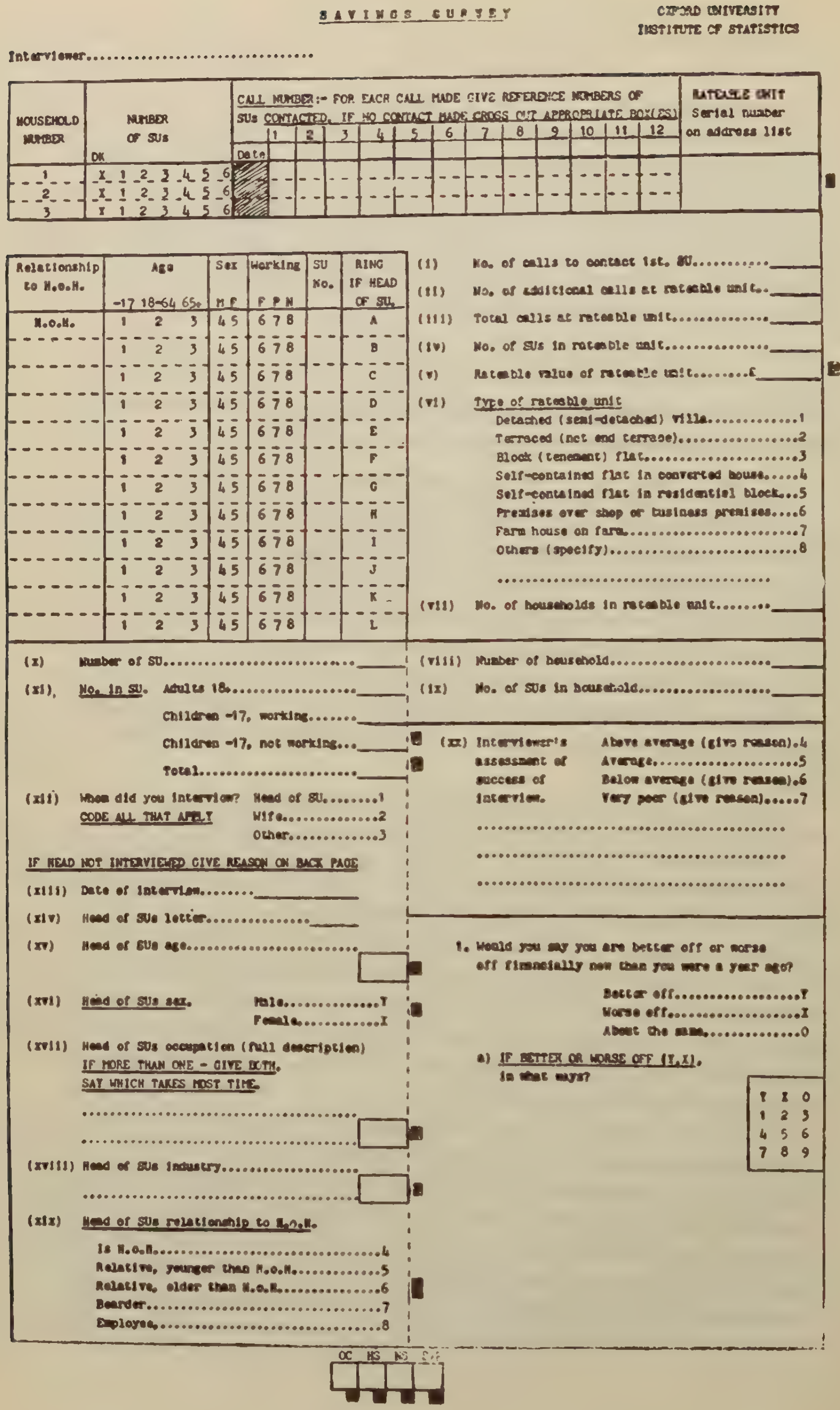
(4) Information about special aspects of the income unit's capital position, such as its total holding of liquid assets, and its expenditure on certain items, such as durable goods, which might be likely to affect its saving behaviour.

(5) The usual social, occupational and demographic data.

(6) A limited amount of attitudinal information, such as the income unit's assessment of the change in its financial situation and its expectations regarding future income and saving.

The working out of this programme in detail, including the arrangement of the questions in a suitable order, was a formidable task; and it is not possible in a brief space to explain all the decisions that were made. The appearance and content of the final questionnaire form can be seen from the facsimile which is printed on pages 214-220. All that will be attempted here is to draw attention to the main features.

The first page of the questionnaire provides space for the social and demographic details: the composition of the household and of the income unit (in the questionnaire it was called an 'SU'—meaning savings unit); the age, sex and occupation of the head of the income unit; and so on. The composition of the household, which appears in the large box in the top left quarter of the page, was recorded at the beginning of the interview, so that the interviewer might ascertain the number of income units to be interviewed; but some of the other ' classificatory ' information—on the occupation and



SAVINGS SURVEY

OXFORD UNIVERSITY
INSTITUTE OF STATISTICS

Interviewer....................................

| HOUSEHOLD NUMBER | NUMBER OF SUs | CALL NUMBER:- FOR EACH CALL MADE GIVE REFERENCE NUMBERS OF SUs CONTACTED. IF NO CONTACT MADE CROSS OUT APPROPRIATE BOX(ES) | | | | | | | | | | | | RATEABLE UNIT Serial number on address list |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DK | Date | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 1 | X 1 2 3 4 5 6 | ▨ | | | | | | | | | | | | | |
| 2 | X 1 2 3 4 5 6 | ▨ | | | | | | | | | | | | | |
| 3 | X 1 2 3 4 5 6 | ▨ | | | | | | | | | | | | | |

| Relationship to H.o.H. | Age<br>-17 18-64 65+ | Sex<br>M F | Working<br>F P N | SU No. | RING IF HEAD OF SU. |
|---|---|---|---|---|---|
| H.o.H. | 1 2 3 | 4 5 | 6 7 8 | | A |
| | 1 2 3 | 4 5 | 6 7 8 | | B |
| | 1 2 3 | 4 5 | 6 7 8 | | C |
| | 1 2 3 | 4 5 | 6 7 8 | | D |
| | 1 2 3 | 4 5 | 6 7 8 | | E |
| | 1 2 3 | 4 5 | 6 7 8 | | F |
| | 1 2 3 | 4 5 | 6 7 8 | | G |
| | 1 2 3 | 4 5 | 6 7 8 | | H |
| | 1 2 3 | 4 5 | 6 7 8 | | I |
| | 1 2 3 | 4 5 | 6 7 8 | | J |
| | 1 2 3 | 4 5 | 6 7 8 | | K |
| | 1 2 3 | 4 5 | 6 7 8 | | L |

(i) No. of calls to contact 1st. SU.............______

(ii) No. of additional calls at rateable unit..______

(iii) Total calls at rateable unit...............______

(iv) No. of SUs in rateable unit...............______

(v) Rateable value of rateable unit........£______

(vi) Type of rateable unit

- Detached (semi-detached) villa..............1
- Terraced (not end terrace)...................2
- Block (tenement) flat........................3
- Self-contained flat in converted house.....4
- Self-contained flat in residential block...5
- Premises over shop or business premises....6
- Farm house on farm...........................7
- Others (specify)..............................8

.........................................

(vii) No. of households in rateable unit........______

(viii) Number of household.........................______

(ix) No. of SUs in household.....................______

(x) Number of SU..............................______

(xi) No. in SU. Adults 18+.....................______

Children -17, working.......______

Children -17, not working...______

Total.........................______

(xii) Whom did you interview? CODE ALL THAT APPLY

- Head of SU........1
- Wife...............2
- Other..............3

IF HEAD NOT INTERVIEWED GIVE REASON ON BACK PAGE

(xiii) Date of interview........______

(xiv) Head of SUs letter................______

(xv) Head of SUs age..........................☐

(xvi) Head of SUs sex.

- Male...............Y
- Female.............X

(xvii) Head of SUs occupation (full description)
IF MORE THAN ONE - GIVE BOTH.
SAY WHICH TAKES MOST TIME.

.......................................

.......................................☐

(xviii) Head of SUs industry.....................

.......................................☐

(xix) Head of SUs relationship to H.o.H.

- Is H.o.H......................................4
- Relative, younger than H.o.H..............5
- Relative, older than H.o.H.................6
- Boarder.......................................7
- Employee......................................8

(xx) Interviewer's assessment of success of interview.

- Above average (give reason).4
- Average........................5
- Below average (give reason).6
- Very poor (give reason).....7

..............................................

..............................................

..............................................

1. Would you say you are better off or worse off financially now than you were a year ago?

- Better off....................Y
- Worse off.....................X
- About the same...............0

a) IF BETTER OR WORSE OFF (Y,X), in what ways?

Y X 0
1 2 3
4 5 6
7 8 9

| OC | HS | NS | [illegible] |
|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ |

2. Do you or your wife or children own any of the following?

PROMPT ITEMS IN TABLE.

FOR EACH ITEM OWNED, did you buy it in the last 12 months since..............(GIVE DATE ONE YEAR AGO)....?

CODE BOUGHT ONLY IF ITEM WAS BOUGHT FOR PERSONAL USE AND NOT FOR USE ON FARM OR FOR BUSINESS/PROFESSIONAL PURPOSE.

| ITEM | Not owned | Bought for personal use only since..... Yes | No |
|---|---|---|---|
| CAR 1 .................. | Y | 2 | 6 |
| CAR 2 .................. | X | 3 | 7 |
| MOTOR CYCLE 1 ........ | 0 | 4 | 8 |
| MOTOR CYCLE 2 ........ | 1 | 5 | 9 |
| TELEVISION SET ........ | 2 | 6 | Y |
| REFRIGERATOR .......... | 3 | 7 | X |
| WASHING MACHINE ....... | 4 | 8 | 0 |

3. Have you bought anything (else) since..... that cost £25 or more? INCLUDE SECONDHAND GOODS.
PROMPT:- HOUSEHOLD APPLIANCES
FURNITURE & CARPETS (NOT SOFT GOODS)
FUR COAT (NOT ORDINARY CLOTHING)
OTHER VALUABLE ITEMS
FOR EACH ITEM BOUGHT, how much did it cost?
EXCLUDE ITEMS BOUGHT FOR: FARM, BUSINESS, PRACTICE.

| Description of item | Retail price £ |
|---|---|
| | |
| | |
| | |
| | |

4. Have you sold or traded-in anything of this sort since.....?
FOR EACH ITEM SOLD, how much did you get for it?

| Description of item | Amount got £ |
|---|---|
| | |
| | |
| | |

5. Have you bought anything on Hire Purchase since.....?
FOR EACH ITEM BOUGHT. { How much is the instalment? How many more have you to pay?

INCLUDE ITEMS BOUGHT ON H/P BY FARMERS FOR THEIR FARMS.

| Description of item | Instalment £ : s : d | No. to pay | OFF USE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

6. Have you paid off H/P since..... on any other goods bought before.....?
FOR ITEMS BOUGHT ON H/P PREVIOUSLY. { How much was the instalment? How many instalments have you paid since.....?

INCLUDE PAYMENTS MADE BY FARMERS ON H/P.

| Description of item | Instalment £ : s : d | No. paid | OFF USE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

7. Do you, your wife or children make regular payments for any of the following:-
PROMPT:- LIFE ASSURANCE
ENDOWMENT ASSURANCE
INDUSTRIAL ASSURANCE (DEATH BENEFIT)
FOR EACH ITEM { How much do you pay each time? How many payments have you made since.....?

| Description of item | Reg. amount £ : s : d | No. paid | OFF USE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

8. Do you belong to a pension scheme or a superannuation scheme? ..............................Yes.............Y
No.............X

a) IF YES (Y), how much have you paid into the fund since..... including deductions made from your wages/salary for this purpose?

| Description of scheme | Amount paid in by SU since..... £ | OFF USE |
|---|---|---|
| | | |
| | | |
| | | |

9. Head of SUs housing status.
IF H.o.H. AND ANOTHER SU EACH PAY PART RENT
EXPLAIN ARRANGEMENT HERE.

.....................................................................

.....................................................................

.....................................................................

IF H.o.H.
Owns outright..........................1
Owns, but has mortgage...............2
Pays rent - Council house.............3
Pays rent - other unfurnished.........4
Pays rent - other furnished..........5
Rent free...............................6

IF NOT H.o.H.
Secondary SU...........................7

10. TO SECONDARY SUs RELATED TO H.o.H.
Do you pay anything towards the
housekeeping expenses?
D.N.A....0
No.......Y
Yes......X...IF YES, how much? £___s___per______

11. TO SECONDARY SUs NOT RELATED TO H.o.H.
Do you pay anything for your
board and lodgings?
D.N.A...3
No......1
Yes.....2...IF YES, how much? £___s___per______

12. TO H.o.H. WHO PAYS RENT.
How much do you pay in rent? How often?
Does this include rates?
IF RATES NOT INCLUDED, how much do you pay in rates? How often?
IF DWELLING INCLUDES BUSINESS OR SHOP ASK FOR DWELLING PART SEPARATELY.

| Payment | OFF USE | Amount each time Dwelling £ | s | Shop £ | No. per year |
|---|---|---|---|---|---|
| Rent (BEFORE TAX) | | | | | |
| Rates, if paid separately | | | | | |
| | | | | | |

13. REPEAT RATEABLE VALUE IN BOX

14. TO H.o.H. WHO OWNS. Do you pay any ground rent or any other charge on the land?
How much? How often?
How much do you pay in rates? How often?

IF DWELLING INCLUDES BUSINESS OR SHOP ASK FOR DWELLING PART SEPARATELY.

| Payment | OFF USE | Amount each time Dwelling £ | s | Shop £ | No. per year |
|---|---|---|---|---|---|
| Ground rent (BEFORE TAX) | | | | | |
| Other charge (SPECIFY) | | | | | |
| Rates | | | | | |
| | | | | | |

............

15. TO ALL SUs. Were you the owner of any other house or property at any time since.....?
Yes.................8
No..................9

TO SUs WHO OWNED THE PROPERTY IN WHICH THEY LIVE OR ANY OTHER PROPERTY AT ANY TIME SINCE.....

16. Have you had a mortgage on the house or property at any time since.....?
IF MORTGAGE.
What instalments were you paying?
How many have you paid since.....?
How much of each instalment was interest?
How much repayment of principal?
IF MORTGAGE IS ASSOCIATED WITH LIFE POLICY TREAT INSURANCE PREMIUM AS PRINCIPAL.

| Description | Amount instal £ | s | No. paid | Interest INCL. TAX £ | s | OFF USE | Principal £ | s | OFF USE |
|---|---|---|---|---|---|---|---|---|---|
| THIS HOUSE | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

17. Have you bought any house or property since.....?
Yes...4...IF YES,
No....5

How much was it? (ACTUAL PRICE NOT COUNTING COSTS OF TRANSFER)....£______
Did you borrow any of this on mortgage or otherwise? How much?...£______
Did you pay the rest out of your own pocket? How much?.........£______

COMMENTS

18. Have you sold any house or property since.....?
Yes...6...IF YES,
No....7

How much did you sell it for? ........£______
How much of this was left after repaying expenses, mortgage etc....£______

19. Have you spent any money since..... on additions or improvements to your house or property?
EXCLUDE REPAIRS AND DECORATIONS & FARMER'S EXPENDITURE ON FARMS.

| Description | Amount actually paid to date £ |
|---|---|
| | |
| | |
| | |

20. Have you been in business or professional practice on your own account at any time since.....?
IF BUSINESS/PROFESSIONAL ASK Qs.21-27 THEN GO TO Q.39.
IF FARMER, SMALLHOLDER, MARKET GARDENER ASK Q.28 ONWARDS.
IF 'NO' OR DIRECTOR PRIVATE COMPANY GO ON TO Q.39.

BUSINESS OR PROFESSIONAL ONLY

21. Are you the sole owner or is it a partnership?
Sole owner..........Y
Partnership.........X

22. As I said we are interested in how much it costs people to live these days. Can you tell me how much money you have actually taken out of the business/practice for living expenses since.....? CASH OUT £______

23. IF MARRIED. Does your wife help in the business/practice?
Yes....0...IF YES { Do you pay her anything for this work? How much? . . . . . . . . . . . . . . . . WIFE'S PAY £______
No.....1
{ IF WIFE PAID, is wife's pay included in money taken out? Yes..........2 No...........3

24. Are you able to estimate the total profit from the business/practice since.....?
IF PARTNERSHIP GIVE RESPONDENT'S SHARE ONLY. . . . . . PROFIT BEFORE TAX £______

Can you tell me what profit was made in the last accounting period? (PERIOD__________). . LAST ACCOUNTS £______

25. Have you sold any part of the business/practice since.....?
IF YES, how much did you receive?. . . . . . . . . . . . . . . . . . . . . . . . . . . . RECEIVED FROM SALE £______

26. Have you put any money into the business/practice since.....?
IF YES, how much?. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .PUT IN £______

27. IF IN BUSINESS. Would you say your business is worth more or less now than it was 12 months ago?
More....4...IF MORE { Why?
Same....5 OR
Less....6...IF LESS { How much?. . . . . . . . . . . { MORE £______ LESS £______

FARMER, SMALLHOLDER OR MARKET GARDENER ONLY

28. Do you run the farm on your own or in partnership?
Sole owner......Y
Partnership.....X

29. Do you own or rent your land?
Own (over half)...0
Rent (over half)..1

30. As I said we are interested in how much it costs people to live these days. Can you tell me what your living expenses have come to since.....? Exclude rent and rates but include fuel, light, telephone etc, if possible. LIVING EXPENSES £______
Are any of these things not included? SPECIFY ........................................

31. How about your own produce used at home. Can you give me an estimate of its value?. . . . . .HOME PRODUCE £______

32. IF MARRIED. Does your wife help on the farm?
Yes..0...IF YES { Is she paid anything for her work or does she make a separate income from the farm?... } WIFE'S SALARY £______
No...1
{ IF WIFE PAID, is your wife's salary included in the living expenses? Yes..2 No...3 } WIFE'S OTHER FARM INCOME £______

33. Can you tell me your farm income for the last accounting period? (PERIOD__________). . LAST ACCOUNTS £______

We are interested in how much you have invested in your farm since.....

OFFICE USE
PLUS £ MINUS £

34. Have you bought any farm machinery, including car for farm use since.....? IF YES, how much did you actually pay for it? ONLY AMOUNTS ACTUALLY PAID TO DATE TO BE INCLUDED.

| Machinery bought | Amount paid £ |
|---|---|
| | |
| | |
| | |
| | |

35. Have you sold any farm machinery, including car used on farm since.....? ONLY AMOUNTS ACTUALLY RECEIVED TO BE INCLUDED.

| Machinery sold | Am't rec'd £ |
|---|---|
| | |
| | |
| | |

36. What could you estimate as the depreciation on your stock of machinery since.....? £______

37. Have you spent any money on additions or improvements to the farm or buildings since.....? ONLY AMOUNTS ACTUALLY PAID TO DATE TO BE INCLUDED.

| Description of work | Amount paid £ |
|---|---|
| | |
| | |
| | |

38. Can you tell me whether the total value of your inventory of livestock, produce, fertiliser, seeds & other stores is greater or less now than it was this time a year ago?
Greater....4. . . . by. £______
Same......5
Less......6. . . . by. £______

NET INVESTMENT______ ______

TO ALL HEADS OF SUs.

39. Now I would like you to give me details of your income since..... What we want to know is your gross income, that is to say, before deduction of Income Tax, National Insurance, Superannuation, National Savings, or anything else of that kind.

Number of separate incomes... ____

| TYPE OF INCOME | | HEAD £ s | WIFE £ s | CHILD £ s | CHILD £ s | OFFICE USE |
|---|---|---|---|---|---|---|
| A Weekly wages. PROMPT FOR OVERTIME & SHORT-TIME. NOT FOR INCOME RECORDED EARLIER. | Last week | | | | | |
| | Average per week - past 12 months | | | | | |
| | Number of weeks at work | | | | | |
| | Holiday money | | | | | |
| OFFICE USE | | £ | £ | £ | £ | |
| B Salaries (ANNUAL FIGURE). NOT INCOMES RECORDED EARLIER. | | | | | | |
| C Other earnings of employment. e.g. Special bonuses commissions, tips, work in spare time. | | | | | | |
| D Retirement pension from employer. | | | | | | ABCD |
| E Old age, widow's pension; health, unemployment, industrial injury benefit; national assistance. EXCLUDE FRIENDLY SOCIETY BENEFITS. | | | | | | |
| F Gross income from lodgers, subletting. NOT BOARDERS | | | | | | |
| G Fees from part-time professional work. | | | | | | |
| OFF - H | | | | | | GH |
| - I | | | | | | FI |
| USE - J | | | | | | J |
| X | | | | | | |
| K Interest, dividends, rent. | | | | | | |
| L Annuities not connected with pension scheme. | | | | | | |
| M Family allowances. | | | | | | |
| OFFICE USE Y | | | | | | |
| N Co-op dividends on purchases. | | | | | | |
| O Building Society interest. | | | | | | KLMNO |
| P War disability pension. | | | | | | EMP |
| Q Contributions by relatives/friends not in household. | | | | | | C |
| R Any other income. SPECIFY. | | | | | | |
| OFFICE USE Z | | | | | | |
| | | | | | T | |

40. Now I want you to think back beyond the past 12 months to the previous 12 months. If you compare these two periods would you say your total income, including the income of wife and children had gone up or down?

Up...........Y..by £____
Same.........0
Down.........X..by £____

a) IF UP OR DOWN (Y,X), why?..........................................................................

| | | |
|---|---|---|
| Y | X | 0 |
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

41. In the coming year do you expect your income to be..

Larger........................................7
About the same................................8
Smaller.......................................9

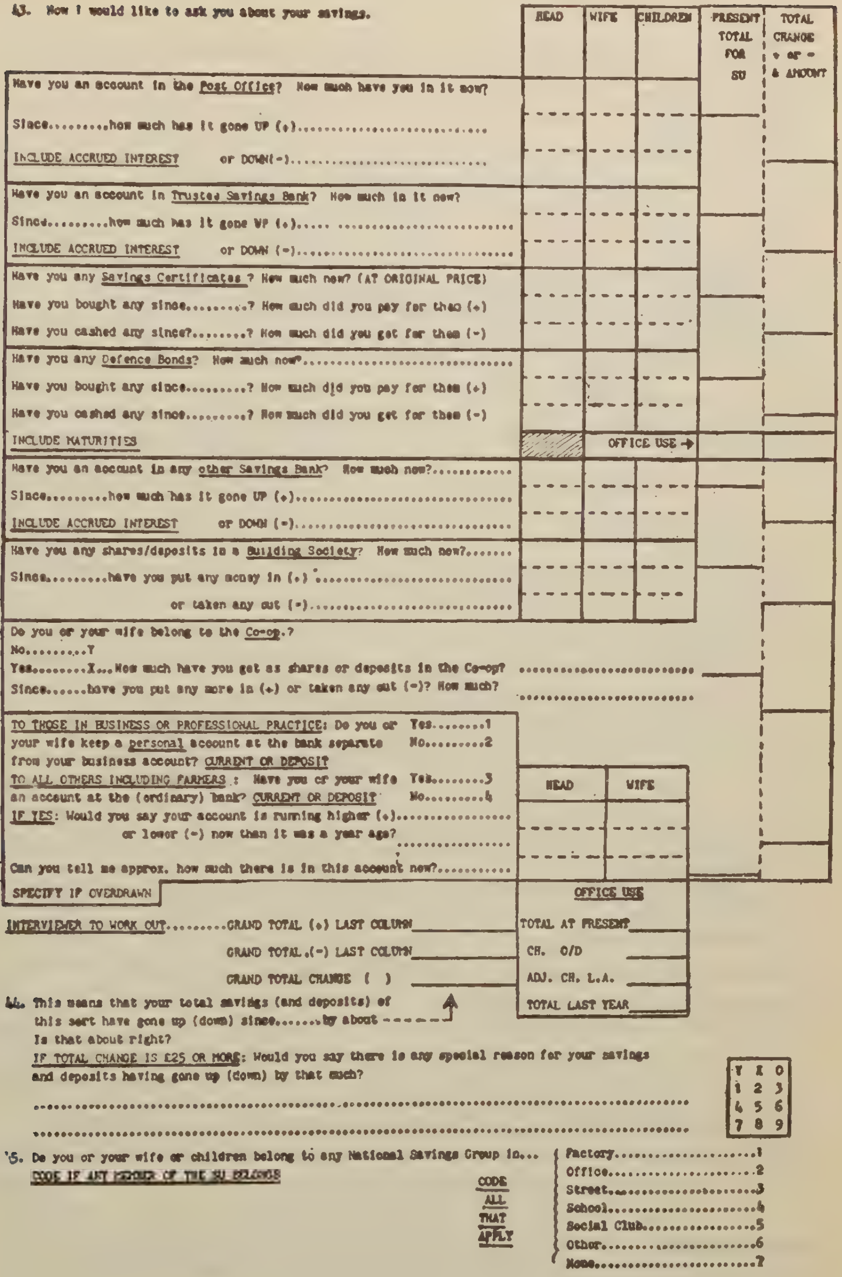
a) Why?..........................................................................................

..................................................................................................

| | | |
|---|---|---|
| Y | X | 0 |
| 1 | 2 | 3 |
| 4 | 5 | 6 |

42. Have you since..... received a lump sum of money from;-
PROMPT ITEMS IN TABLE AND RING NUMBERS (IN LAST COLUMN) OF ITEMS RECEIVED.
Was it in cash or what form?
How much did you get?

| Item | Cash Other SPECIFY | Amount rec'd £ | Item rec'd |
|---|---|---|---|
| A legacy or gift | Y | | 1 |
| A life insurance policy | Y | | 2 |
| Any other insurance policy | Y | | 3 |
| A pension fund | Y | | 4 |
| Football pool | Y | | 5 |
| Sweepstake | Y | | 6 |
| Post-war Credits | Y | | 7 |
| Any other source | Y | | 8 |
| | | | |



43. Now I would like to ask you about your savings.

| | HEAD | WIFE | CHILDREN | PRESENT TOTAL FOR SU | TOTAL CHANGE + or − & AMOUNT |
|---|---|---|---|---|---|
| Have you an account in the Post Office? How much have you in it now? | | | | | |
| Since.........how much has it gone UP (+)......................... | | | | | |
| INCLUDE ACCRUED INTEREST or DOWN(−).......................... | | | | | |
| Have you an account in Trustee Savings Bank? How much in it now? | | | | | |
| Since.........how much has it gone UP (+)..... ......................... | | | | | |
| INCLUDE ACCRUED INTEREST or DOWN (−)............................... | | | | | |
| Have you any Savings Certificates? How much now? (AT ORIGINAL PRICE) | | | | | |
| Have you bought any since.........? How much did you pay for them (+) | | | | | |
| Have you cashed any since?.........? How much did you get for them (−) | | | | | |
| Have you any Defence Bonds? How much now?.............................. | | | | | |
| Have you bought any since.........? How much did you pay for them (+) | | | | | |
| Have you cashed any since.........? How much did you get for them (−) | | | | | |
| INCLUDE MATURITIES | ▨ | OFFICE USE → | | | |
| Have you an account in any other Savings Bank? How much now?............ | | | | | |
| Since.........how much has it gone UP (+).............................. | | | | | |
| INCLUDE ACCRUED INTEREST or DOWN (−).............................. | | | | | |
| Have you any shares/deposits in a Building Society? How much now?....... | | | | | |
| Since.........have you put any money in (+) ............................ | | | | | |
| or taken any out (−)............................ | | | | | |

Do you or your wife belong to the Co-op.?
No.........Y
Yes.........X...How much have you got as shares or deposits in the Co-op? .........................
Since......have you put any more in (+) or taken any out (−)? How much? .........................

TO THOSE IN BUSINESS OR PROFESSIONAL PRACTICE: Do you or your wife keep a personal account at the bank separate from your business account? CURRENT OR DEPOSIT
Yes.........1
No..........2

TO ALL OTHERS INCLUDING FARMERS: Have you or your wife an account at the (ordinary) bank? CURRENT OR DEPOSIT
Yes.........3
No..........4

| | HEAD | WIFE |
|---|---|---|
| IF YES: Would you say your account is running higher (+)................. | | |
| or lower (−) now than it was a year ago? ................. | | |
| Can you tell me approx. how much there is in this account now?........... | | |
| SPECIFY IF OVERDRAWN | | |

INTERVIEWER TO WORK OUT.........GRAND TOTAL (+) LAST COLUMN ______
GRAND TOTAL (−) LAST COLUMN ______
GRAND TOTAL CHANGE ( ) ______

OFFICE USE
TOTAL AT PRESENT ______
CH. O/D ______
ADJ. CH. L.A. ______
TOTAL LAST YEAR ______

44. This means that your total savings (and deposits) of this sort have gone up (down) since.......by about ------
Is that about right?
IF TOTAL CHANGE IS £25 OR MORE: Would you say there is any special reason for your savings and deposits having gone up (down) by that much?

.............................................................................................

.............................................................................................

| | | |
|---|---|---|
| Y | X | 0 |
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

45. Do you or your wife or children belong to any National Savings Group in...
CODE IF ANY MEMBER OF THE SU BELONGS

CODE ALL THAT APPLY

Factory........................1
Office.........................2
Street.........................3
School.........................4
Social Club....................5
Other..........................6
None...........................7

46. Have you since..... either given or lent anyone any money (more than £5) or paid back a debt - apart from payments to your bank or on a mortgage?
INCLUDE BUSINESS TRANSACTIONS BY FARMERS BUT NOT BY BUSINESS OR PROFESSIONAL.

| Description of transaction | Amount paid £ |
|---|---|
| | |
| | |
| | |
| | |
| | |

47. Have you borrowed any money since.....(more than £5) or has anyone paid back any money they owed you?
INCLUDE BUSINESS TRANSACTIONS BY FARMERS BUT NOT BY BUSINESS OR PROFESSIONAL.
INCLUDE BANK LOANS.
EXCLUDE OVERDRAFTS.
EXCLUDE LOANS FOR HOUSES.

| Description of transaction | Amount paid £ |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

48. Do you own any stocks or shares?
IF YES, can you tell me approx. how much you have got in stocks and shares at their present value?

| | |
|---|---|
| None | 0 |
| Up to £100 | 1 |
| Over £100 - £500 | 2 |
| Over £500 - £2,000 | 3 |
| Over £2,000 - £10,000 | 4 |
| Over £10,000 | 5 |

49. Have you bought or sold any stocks or shares since.....?
EXCLUDE DEFENCE BONDS.

| | |
|---|---|
| Yes | Y |
| No | X |

a) IF BOUGHT, how much did you pay for them?....£_______

b) IF SOLD, how much did you get for them?......£_______

c) IF (a) AND (b) NOT ANSWERED, can you tell me the net difference?..........£_______

50. Have you bought an annuity since.....?
IF YES, how much did you pay for it?

| Description of annuity bought | Amount paid £ |
|---|---|
| | |
| | |
| | |

51. Do you run any accounts with shopkeepers or traders of any sort?
INCLUDE FARMERS ACCOUNTS WITH SHOPKEEPERS AND TRADERS BUT NOT BUSINESS OR PROFESSIONAL.
IF YES, would you say you owe more or less or about the same as you did a year ago?

| | |
|---|---|
| No account | 6 |
| More | 7 |
| Less | 8 |
| About the same | 9 |

a) IF MORE (7), how much more?.................£_______

IF LESS (8), how much less?..................£_______

52. Looking back over the last 12 months would you say you had any unusual or extra heavy expenses?

.............................................................................................

.............................................................................................

| | | |
|---|---|---|
| Y | X | 0 |
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

53. Do you think during the coming year you will save anything out of your income, or do you expect to draw on past savings? What do you expect to do?

.............................................................................................

.............................................................................................

| | | |
|---|---|---|
| Y | X | 0 |
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

REMINDER TO INTERVIEWER.

If the saving unit has had any large money transactions of any kind during the year go back through the schedule with your respondent to find out where the money came from and went to.

industry of the head of the income unit, for example—could be recorded later in the interview.

The questionnaire proper begins with the question in the bottom right corner of the first page. This question, which follows almost identically a question regularly asked in the American Surveys of Consumer Finances, was included primarily because it was thought to be a useful way of starting the interview. Most people are happy to discuss the change in their financial circumstances in general; and the question leads naturally on to the more factual parts of the interview that follow.

The second page is devoted to two main subjects. At this stage of the interview the interviewer is still trying to build up confidence and to lay the basis for the rather severe financial cross-examination of the later pages. Questions 2—6 are concerned with the ownership of certain durable goods, with expenditure on the purchase of these, and with hire-purchase transactions. The information about hire-purchase was required for the estimation of saving, since any change in hire-purchase indebtedness affects the capital account of the person concerned. An increase in hire-purchase indebtedness is counted as dissaving, and a reduction in hire-purchase indebtedness as saving.

Questions 7 and 8 are concerned with two kinds of contractual saving: life assurance payments and pension fund contributions. These transactions are very widespread and people do not generally feel secretive about them. In each case, as throughout the questionnaire, the questions are framed in such a way as to provide information about the annual amount of payments made.

The third page is devoted to questions about housing tenure, housing expenditure—*i.e.*, rent, rates or mortgage payments—and the purchase and sale of property. The information on housing tenure was wanted partly for purposes of classification and partly as an introduction to this section. Questions 10—14 were not essential to the main purpose of the survey but it was thought useful to take advantage of this opportunity to collect data on housing expenditure which could be related to income and asset ownership. Questions 15—19, however, are concerned with capital transactions in property—including the repayment of mortgage principal, which is treated as part of contractual saving—and they are essential to the computation of saving. If an income unit sells a house, the proceeds—after deduction of costs and the repayment of mortgages and loans—enter as a debit item in the saving account; while if a house is bought, or money is spent on additions or improvements to property, the sums spent are credited to the saving account. If the funds emerging from a sale are retained as capital in another form, there will, of course, be a contra entry against that form of capital in the savings account; and similarly with a purchase of property which is financed by the realisation of other capital.

At the fourth page we come to questions about the incomes of self-employed business men, professional people and farmers. The purpose of these questions is partly to discover the total profit of the enterprise and partly to find out how much of the profit was ploughed back into the business during the past year. This latter item enters into the saving account, and it can, of course, be negative if the amount of money taken out of the business exceeds the profit for that period. It is very difficult to get a reliable figure of profit ploughed back, and in these questions we have approached the problem in several ways. For the business and professional man the principal method employed was to ask him—at Question 22—how much money he had taken out in the past year for living expenses; then to ask him—at Question 24—what was his total profit before tax. The amount of tax payable can be computed; and so we discovered, as a residual, the amount of profit ploughed back. As a slight, but not very satisfactory, check on this we have Question 27 : ' Would you say your business is worth more or less now than it was 12 months ago ? ' Question 23 is designed to discover whether the business man employs his wife; and, if so, how much he pays her. This affects their joint tax liability. Questions 25 and 26 are needed for the saving account.

For farmers, the questions were put in two different ways. Questions 28—33 are similar to those applicable to business men, with some modifications to apply them to the conditions of farming. In Questions 34—38, however, we attempt to obtain a direct estimate of the change in farm capital. The most difficult questions in this part are those which deal with depreciation and the change in inventory, and, after studying the results of these questions, we did not feel that we could place a great deal of reliance upon them.

In the main box on the fifth page follow the questions on the other sources of income. All the main sources of income are listed in detail, partly with the object of ensuring that no individual source was overlooked, and partly because it was necessary to break down total income into its component parts. For the purpose of estimating tax liability total income had to be classified into three main parts : earned income, unearned income and tax-exempt income. Broadly speaking, the items from A to J constitute earned income, those from K to M unearned income and the remainder are tax-exempt. For the purpose of ultimate analysis of the results the components were also grouped according to a different set of criteria. At the editing stage, the total of items A, B, C and D, for all members of the income unit, was entered in the box labelled ABCD. This represents employment income. Boxes GH, FI and J were designed to contain the profits from professions, businesses and farms ; box KLNO is for rent, interest and dividends; box EMP is for government transfers and box Q is for private transfers.

The aim of all the questions in this section was to discover the income received, before tax, over the past 12 months. We were fully aware that many people find it difficult to estimate their annual income. This is especially true of manual workers, whose earnings generally fluctuate from week to week.

Instructions were given to the interviewers to ask all weekly wage-earners if they could give their total pay, before tax, in the preceding tax year. Many of them would have recently received a notice from their employers containing this information, and it was hoped that they would be able to produce it. In fact, only a minority could do so. For the majority, therefore the standard procedure was to ask the four questions printed in section A. The first of these was intended mainly as a means of focussing attention on the subject. It was necessary to get clear what concept of income was under discussion: namely, actual earnings before tax or other deductions. After this we went on to ask what was the average wage received for each week worked over the past 12 months. This is obviously a very difficult question for any wage-earner to answer; but it seemed the only way to seek the desired information. It is impossible to say how reliable the answers to this question are. The distribution of manual workers' incomes obtained from the survey accord with what one would expect; but it is possible that the whole distribution is slightly biased in one direction or another. General impressions suggest that the bias, if it exists, is in a downward rather than an upward direction. The total annual earnings of weekly wage-earners were estimated, for all those cases in which a direct figure was not available, by multiplying the informant's estimate of his average weekly earnings by the number of weeks at work. To this was added the amount of holiday money received.

For the other sources of income, it was not expected that the problem of estimating the annual amount of income received would be so difficult. It must be remembered that, about this time of the year, many of the people interviewed would have recently had the task of filling up their income tax returns. It was hoped that they would have been fortified by this experience and be in a better position to answer our questions.

Most of the remaining items of income are self-explanatory, and a few notes on them should suffice. Item C was intended for irregular and part-time earnings of persons other than those with professional qualifications. The spare-time earnings of professional people—*e.g.*, from lecturing and writing—were included in item G, and they were later grouped with the normal earnings of self-employed professional people in box GH. The lines labelled H, I and J were used for inserting—at the editing stage—the profits of professions, businesses and farms, as discovered in the earlier part of the questionnaire. Interest, dividends and rent, shown in item K, were intended to be recorded gross of tax, even if the amounts received were net of tax. Interviewers were instructed to remind people to include interest on savings bank deposits; but they may not have been very successful in this. Building society interest, which is taxed at a special rate and can normally be regarded as tax-exempt to the individual, is recorded as item O.

Questions 40 and 41 are concerned with the past change in income of the income unit and its expected future change in income. According to some hypotheses, each of these may be important factors affecting current saving behaviour.

Question 42 is designed to discover whether any lump sums of money have been received in the past year, from sources not classified as current income. When these sums occur they are debited in the saving account, since any rise in assets which is attributable to receipts of this kind cannot by definition be part of saving out of income.

The main body of the sixth page of the questionnaire is devoted to the subject of liquid asset-holdings. The purpose of Question 43 is to discover the current holdings of each of the eight types of liquid assets and the net changes, if any, that have occurred over the past 12 months. The information about liquid asset holdings was wanted for its own sake and also as a possible means of explaining saving behaviour; the changes in liquid asset holdings form part of the saving account. All the questions follow a similar pattern, with the exception that, in the question about bank accounts, the order of questioning is reversed. This was done because it was thought that some people might be unwilling to give figures of their current holdings of bank deposits and that it would be better to ask for the net change in their accounts first. It should also be noted that no information was sought about bank accounts which were used wholly or partly for business or professional purposes. This necessarily followed from the method of estimating business saving, since profits ploughed back into a business can—at least temporarily—take the form of an increase in the liquid assets held in the business.

After asking about each liquid asset in turn, the interviewer added up the total net change in liquid asset-holdings and, if the change amounted to £25 or more in either direction, she proceeded to ask the second part of Question 44. The answers to this question were particularly useful at the editing stage when the complete saving account had to be made out. They helped to explain for example, the movements of assets from one part of the account to another. It would, indeed, have been an improvement if more questions of this type, designed to explain movements in constituent items of the saving account, had been included at each stage of the interview.

Question 45 was not essential to the purpose of the survey, but it was included here because it was thought to be of some interest to compare the saving behaviour of people who belong to National Savings Groups with others.

Questions 46—47 and 49—51 on the seventh page cover the remaining capital transactions which enter into the saving account. Question 48 was included as a convenient introduction to Question 49 and because of its intrinsic interest in this connection; Question 52 was intended as a means of discovering particular factors which might have influenced the income unit's saving behaviour in the past year; and Question 53 was to a large extent a question designed to end the interview on a less factual and more personal note.

On the eighth—and last—page of the questionnaire, which is not reproduced, space was available for notes and comments by the interviewer; and boxes were provided for recording the results of the various computations performed at the editing stage.

It must be admitted that this questionnaire is a formidable document. The information sought in it was both intricate and exhaustive; and the man with large financial interests, or the person who had engaged in important capital transactions during the year, often found some difficulty in complying with our demands for reasonably accurate information. Nevertheless, by and large, the questionnaire worked : very few people who consented to start the interview refused to complete it; and the information given was, as far as we can judge, usually the best that the informants were able to provide. They were encouraged to look up records wherever possible; and many of them were most generous in their willingness to do so. Many interviews took as much as one hour to complete and some lasted for two hours or more.

## Operational Procedure

### *Date of Survey*

There was some question about the best time of year at which to carry out this survey. Good arguments could be adduced, on the grounds of comparability with other data, for a survey covering either the calendar year or the fiscal year. As between these alternatives, the latter was chosen for two reasons : firstly, it was desirable to carry out most of the interviews in the evening, when people at work in the day would be available; and evening interviews in January and February are not easy. Secondly, it was hoped that an appreciable number of the people interviewed would know what their incomes were for the fiscal year, because of the necessity of making tax returns for that period. Hence the interviewing period was fixed to start in the last week of April—after Easter—and to finish by the end of May.

### *Organisation of Fieldwork*

The Social Survey very kindly put at our disposal the services of 73 of their trained interviewers, whom we employed directly for this survey. Briefing meetings were arranged in six centres during the first fortnight of April. Before attending the briefing each interviewer received copies of the questionnaire and the written instructions, and was obliged to make two trial interviews. After the briefing each interviewer made three further trial interviews, which were carefully scrutinised and corrected before she was allowed to proceed with the actual sample. No special steps were taken to supervise interviewers in the field. but each form underwent a careful examination for completeness and internal consistency. Many of the items recorded on the form are interdependent and can be used as a check on one another. If they are found to be mutually consistent this is usually good evidence of the integrity of both the interviewer and the informant.

The interviewers were advised to make most of their calls after working hours or at week-ends; but they sometimes found it advantageous to callin the daytime in order to make appointments or to interview people easily available at that time. No limit was placed on the number of calls that might be made at any one address, if they were needed to establish contact with the right people. Emphasis was laid on the importance of obtaining the highest possible response rate.

When the interviewer called at a house her first task was to discover how many households were living there, and how many income units there were in each household. It was generally found that the most satisfactory approach was to ask to speak to the head of the household. To him—or her—the interviewer would explain the purpose of the survey and then, if possible, obtain information about the household composition. If the head of household was himself willing to be interviewed, the interviewer would normally proceed with that interview immediately, taking the other heads of income units subsequently. Quite frequently, appointments had to be made to see people at times convenient to themselves. All interviews were to be made, so far as possible, with the head of the income unit to which the data referred. Extra information was also sought, where necessary, from other members of the income unit, but interviews with wives alone—without the corroboration of their husbands—were accepted only when the husband was not available and the interviewer was convinced that the wife could give reliable information on the financial affairs of the income unit.

An interview was to be made, if possible, with each income unit ' normally residing ' at each rateable unit on the list. An exception was made if it was found that the rateable unit contained more than three households. Since, in that case, quite a large number of interviews might have to be made at that address, and it would become extremely difficult to secure co-operation from so many people living in a single house, it was decided that not more than three households at any one address should be included in the sample. Where the interviewer found more than three, she was instructed to select three at random. Under the rule of ' normal residence ' people who were temporarily away from home on business or holiday, or in hospital, were included in the sample. If a person had two homes he was to be regarded as normally residing at the address where he spent most of his time. Members of the Armed Forces stationed away from home were excluded; but their wives and families were to be included if they were living in an address on the sample list.

The standard rule for differentiating income units was that each person aged 18 and over was to be regarded as a separate income unit, husband and wife counting as a single unit. In a few cases, however, this rule was extended and people of less than 18 were treated as separate income units. Thus, a boy of 17, already married, was regarded as a separate income unit; and boys or girls who were already at work and living away from home were treated similarly. But students, even if living away from home, were not treated as separate income units unless they were aged 18 or over.

Interviewers were obliged to return a questionnaire for each income unit discovered by them in the sample. When they failed to make contact with the income unit or encountered a refusal, they were asked to give as much information as possible about the composition of the household, and the social and occupational characteristics of the income unit. In addition, they gave a full explanation of the reason for non-contact.

### *Editing and Coding*

As the questionnaires were received from the field they were scrutinised for completeness. Then they passed through a special process known as ' editing.' In many surveys the questionnaire is so designed that the information recorded on it can immediately be transferred to punched cards or tabulation sheets. When this arrangement is possible it is obviously a great economy. But in this survey there were two important pieces of information —and several subsidiary ones—which could only be obtained as derived statistics. The first important derived figure was an estimate of the direct tax liability of the income unit; and the second was its total saving. It was the function of a group of ' editors ' to go through each questionnaire and take out the appropriate data for these computations. Special worksheets were designed for expediting the work and a set of detailed rules were laid down on how the editors were to operate. There were, however, numerous cases where it proved necessary to make a judgment on the data, and these forms were referred to special supervisors.

The worksheet for estimating income tax provided space for the income of both husband and wife; each of the principal reliefs and allowances were specified; and earned and unearned income were treated separately. It was not always possible to be certain about the exact reliefs obtainable in each case (for example, the relief which is granted in certain cases to a man who employs a housekeeper) and no information was available about the incidence of dependent relative relief. Nevertheless it was possible to arrive at a figure which was likely to be close to the correct one. The worksheet for computing saving contained a list of debit and credit items, drawn from many different parts of the questionnaire. Sub-totals were computed for contractual saving, the net change in liquid assets and the remainder, and these, in combination, provided the figure of total saving. There were other worksheets for working out surtax liability, business saving and farm income; and the editors had also the duty of making several simple computations on the questionnaire itself. For example, they added up the total amount spent on durable goods; they worked out the annual expenditure on hire-purchase repayment, life assurance premiums, rent, mortgages, etc.; they subtracted tax liability from gross income and obtained net income; and they subtracted saving from net income to arrive at total consumption expenditure.

All of this was a task of considerable size and of great importance for the ultimate analysis. About eight people were fully employed on the editing process for a period of five weeks. Special measures had to be taken to check their work and to ensure accuracy; and each form was finally checked by one of the supervisors. The most difficult forms were those relating to people owning private businesses or farms; and all of these forms were dealt with by the supervisory staff. They had to study each of these cases very fully and to try to interpret the data collected when it was not unambiguously clear. Inevitably, an element of personal judgment entered into these interpretations.

At the editing stage adjustments were also made to the number and composition of some income units. Where a person was found to have a total income of less than £50 and he (or she) was living with his relations, he was assumed to be a dependent of his relations, and he was consequently ' amalgamated ' with them. In all, 32 of the original income units were extinguished in this way.

The results of the editing process were transferred on to the back page of the questionnaire, where they were ready for punching along with the other data on the form. In the next stage, the forms were passed to computers who carried out some routine calculations on these figures. For example, several items (including total liquid assets holdings and total saving) were expressed as a percentage of net income.

Next, the forms passed to a group of coders. One of their tasks was to classify the answers to the attitudinal questions. For example, in Question 1, people who said they were better off or worse off than a year ago were asked : ' In what ways ? ' Each group of answers to this subsidiary question was given a code number, and the appropriate code was marked on the form. Other questions that required coding in this manner were Questions 40, 41, 52 and 53. Another sort of coding operation was to convert a continuous variable into a series of groups for use in subsequent tabulation. For example, the age of the head of the income unit was coded in six groups; gross income was coded in twelve groups; and expenditure on durable goods as a percentage of net income was coded in ten groups. The occupation and industry of the head of the income unit were also coded into appropriate groups, the details of which were given in a previous article.[1]

### *Tabulation and Analysis*

The data, now ready for tabulation, were transferred to punched cards. Each questionnaire occupied seven Hollerith 80-column cards. The scheme of tabulations was designed by the Social Survey and the work was performed by the Tabulating Research Centre.

It was necessary at this stage to take decisions about the methods to be used in weighting the results. Since two strata of houses within each town had been sampled with different probabilities, it was obviously necessary to employ at least two weights. If all the income units selected within these two strata had been successfully interviewed, the weights would have been inversely proportional to the original sampling probabilities—which were in the ratio of 5 to 1. In actual fact, however, an appreciable proportion of income units were not successfully interviewed, and the proportion of non-respondents was considerably larger in the upper stratum of houses than in the lower. In the houses rated at £30 and over the response rate was 59 per cent; in those rated at less than £30 it was 78 per cent. Moreover, there was a significant tendency for the response rate, at each level of rateable value, to be higher in the rural districts than in the towns, and higher in the smaller towns than in the conurbations. As can be seen from Table 4, the weighted response rate in conurbations was 66 per cent, in other urban districts 77 per cent and in rural districts 86 per cent. Most of this difference in total response was due to a variation in the proportion of direct refusals of interviews. The difference in degree of co-operation in town and country was not simply due to the fact that a greater proportion of country dwellings are in the lower rateable value groups. As the table shows, the response rate was higher in the country at each level of rateable value than in the towns.

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[1] BULLETIN, Vol. XIV, No. 11 and 12, Nov.–Dec., 1952.

TABLE 4

*Response Rates Analysed by Rateable Value of Dwelling and Size of Town*
(*successful interviews expressed as a percentage of total possible interviews in each group*)

| *Rateable value of dwelling* | *Great Britain* | *Size of town* | | |
|---|---|---|---|---|
| | | *Conurbation* | *Other urban* | *Rural* |
| Under £10 ... ... | 84 | 73 | 84 | 90 |
| £10 to £19 ... ... | 79 | 74 | 81 | 84 |
| £20 to £29 ... ... | 68 | 64 | 69 | 83[1] |
| £30 to £39 ... ... | 63 | 62 | 63 | 81 |
| £40 to £49 ... ... | 55 | 51 | 55 | 80[1] |
| £50 and over ... ... | 51 | 46 | 56 | 57 |
| Under £30 ... ... | 78 | 69 | 80 | 87 |
| £30 and over ... ... | 59 | 56 | 60 | 70 |
| All dwellings (weighted) | 75 | 66 | 77 | 86 |

[1] Based on a sample of less than 50.

The difference between the response rates in the three types of area seemed to be so large as to justify re-weighting the sample by reference to them. When taken in conjunction with the necessary re-weighting of the sample by the two rateable value strata, this decision entailed the use of six different weights.

The process of re-weighting results is almost always a tiresome one, and can become rather costly. There are three principal ways in which the work can be handled: (1) each section of the sample can be analysed separately and the results weighted and summed by computers or on punched card machines; (2) if there are only a few weights and they approximate to being simple multiples of the group with the least weight, either the cards relating to each section of the sample can be reproduced an appropriate number of times to make up a weighted pack of cards for the whole sample, or the weighting may be done fairly easily on a tabulator; (3) in the last resort, each card can have its own special weight punched on it and the tabulating machine can be set to sum the weights for each group of cards so as to produce a weighted frequency distribution.

The first method becomes very cumbersome if there are many weights to be applied; but where the analysis is a fairly simple one, and especially if it is desired to study the data in the separate weight groups in any case, this method may still prove to be the most economical. The second method becomes costly if the number of cards in the re-weighted pack is very large or, in the case where the tabulator performs the multiplications, if too much of the machine's capacity is taken up with this part of the operation. The third method is generally slower and more expensive in machine time but, once it has been decided to adopt it, there is no restriction on the number of weights that can be used.

The decision on which of these three methods is most economical for a particular survey depends on several factors, of which the most important are: the number of weights to be used, their relative values, the machines available and the types of analysis required from the data. After all these factors had been taken into account it was decided, in this survey, that the best method to employ was the third one. Once this decision had been taken there was no obstacle on the ground of cost to increasing the number of weights above the original number of six; and since there appeared to be some variation in the response rate between the four main regions of the country, in addition to the variation between town and country within each region, it was decided to take this into account. Hence, the total number of weights employed was raised to twenty-four.

The re-weighting of results to compensate for variations in response rates is always a makeshift proceeding. The assumption behind it is that, although there are differences in response rate *between* identifiable groups of the population, there are no important differences *within* those groups. Moreover, there can be no advantage in re-weighting unless there is some association between the qualities that are under observation in the survey and the characteristics of the groups exhibiting variation in response rate. In order to test the effect of the weighting system employed in this survey, some alternative tabulations were produced for a few major variables in which only two weights were used—one for each of the original strata. A comparison of these tables with the normal 24-weight tables showed that, at least for these variables, both systems of weighting produced almost identical results; from which it can be concluded that the system of weighting employed in this survey was not particularly useful.

The volume of information obtained in this survey was exceptionally large and the analysis required a very extensive programme of tabulations. Almost all the items were cross-tabulated with at least four of the classificatory attributes, such as, region, size of town, age, sex and occupation of head, number of persons in the income unit and gross income group. The scheme of tabulations—designed to provide frequency distributions in all cases, and means and standard deviations in the great majority of cases—was very complex, especially in view of the necessity of weighting the results. The planning of efficient machine tabulations is a highly specialised function and no attempt will be made here to describe in detail the tabulating methods used.

The figures produced by the sorting and tabulating machines were the raw data for the analysis. Each table had next to pass through the hands of computers—who worked out percentage distributions, means and standard deviations—and thence to typists.

## The Reliability of the Results

How far can the results from one sample of 2,600 income units be regarded as representative of the true situation amongst all the income units in private households in Great Britain ? This crucial question has recurred at many stages in the course of previous articles. At particular points in the analysis attention has been drawn to possible causes of error. In this section it is proposed to make a systematic examination of the causes of error and of their probable degrees of importance.

The errors which arise in a survey of this sort may be classified under three headings. Firstly, there are errors which may be described as errors due to human weakness and inefficiency. In the course of the collection of data by human beings from human beings there are many possibilities of mistakes, misunderstandings, carelessness and stupidity. There may be deliberate dishonesty. Errors may arise from one or other of these causes at all stages of an inquiry from the time that interviewers set out into the field until the page proofs of the final report are passed for publication.

The second type of error is that which arises from bias in the selection of the sample. Bias may be caused by faulty sampling methods, lack of proper control of the process of selection, or hidden defects in the sample frame from which the sampling units were drawn. Generally, of course, all these matters are thoroughly considered beforehand and a sampling procedure is designed which will avoid any known causes of bias. But there is one possible cause of bias over which the planner of a sample survey of a human population has, in the final analysis, no control : namely, the fact that the ultimate decision whether a particular person shall be included in the sample rests with that person alone. In all surveys, there are some people who are unable or unwilling to be interviewed; and the question arises whether these ‘ non-respondents ’, as a group, differ materially from the rest of the population in respect of the characteristics that are under observation.

The third type of error that occurs in sample surveys is sampling error—the possibility that the characteristics of the sample deviate to some degree from the characteristics of the population from which it was drawn. This type of error is quite distinct from bias : whereas biases can, in principle, be eliminated, sampling error cannot be entirely eliminated so long as there is any variability in the population from which the sample was drawn. But the principles underlying sampling variations are well-known, and the limits within which an estimate is likely to deviate from the true value on this account can be accurately prescribed.

We shall proceed to discuss each of these types of error in greater detail.

### *Errors due to Human Weakness*

The catalogue of errors which may arise from imperfections of the human agency is very long: it will be possible only to touch on the more important. The first mistake that may occur, in order of time, is that the person drawing the sample may fail to follow exactly the instructions, or copy down the wrong information from the sampling list. Next, the interviewer may interview the wrong person—through a careless reading of her instructions—or she may ask the wrong questions, or fail to ask all the appropriate questions, or phrase the questions incorrectly. Even if the interviewer sticks closely to her instructions and to the text of the questionnaire, the person interviewed may misunderstand a question and give an irrelevant or inaccurate answer. This will usually be the fault of the person who designed the questionnaire.

The questions may be correctly phrased and correctly understood, but the person interviewed—hereafter called the ' informant '—may not be able to give an accurate answer. This may happen because it is impossible for the informant to know the correct answer—as for example if the accounts of a business have not yet been made up—or because he has forgotten the answer —as when he is asked to remember his income for a whole year, or the state of his bank account 12 months ago. In this survey there were many questions whose answers depended on the good memory of informants. When dealing with such questions, interviewers were instructed to encourage their informants to look up records or to think carefully back over the year's experience. If they were still uncertain of the correct answer they were asked to give a range of estimates. It was hoped that in the aggregate, such errors of estimation would be randomly distributed. Even if they are so distributed, however, they will have had the effect of increasing—very slightly—the total sampling error.

Once the information has been given by the informant, it starts on a long chain of transcriptions and interpretations, First, it has to be written down by the interviewer; then it is read, and possibly transferred to a worksheet, by an editor; it may have to be understood and classified by a coder; and it may form the raw material of an addition or multiplication sum by a computer. Each of these operators, in turn, will have to copy out his answer, in the right place, legibly and accurately. Then cards must be punched, and the machines set to sort and read the data. Serious errors can arise in punching, and the machines themselves are not infallible. Finally, the tables must be copied and analysed, and further tables prepared. In all of this there are dangers of the occurrence of simple, but sometimes devastating, mistakes.

The supervision and careful checking of all these processes are highly responsible and arduous tasks. If sufficient attention is not given to these aspects, large and serious errors may occur, and the valuable work done in the earlier stages of the survey may be spoiled. In this survey much time and thought was devoted to the checking of the editing and coding operations; and the stringent checks were carried out on the punching, machining and computing of the data. Fortunately, much of the information was interlocking and, sooner or later, mistakes were generally discovered. But it would be a brave man who would guarantee that all processing errors had been eliminated from a statistical analysis of this sort.

### *Errors due to Bias in Sample Selection*

So far as is known, there were no appreciable causes of bias in the selection of the sample of rateable units. It is true that one of the towns originally drawn had to be rejected, because its council was unwilling to allow access to its rating records. It was a town at which there is an important naval base and it may be that similar difficulties would occur in other towns where security is regarded as important. If so, families living in such towns will have less chance of being selected for a sample of this sort than others. Further small biases may have occurred during the drawing of the individual rateable units from the rating lists; but there is no specific evidence of these. Some biases may also have crept in when the sample was being adjusted at headquarters, if the estimates of the average number of persons per rateable unit in the different first-stage strata were wrong. These would slightly alter the weighting of the sample.

But none of these causes of bias are of any consequence in comparison with the possible effects of non-response. After the selection of the sample of rateable units 31 per cent of the income units living in those dwellings were excluded—or excluded themselves—from the sample. (The weighted response rate was 75 per cent, but the crude response rate, which was much affected by the heavy over-sampling of large houses, was only 69 per cent.) Clearly, therefore, we must give particular attention to the influence of non-response on the representativeness of the ultimate sample.

The response rate is defined as follows. The designated sample of income units consists of all those normally residing in the rateable units on the sample list, with the exception of those excluded under the rule that not more than three households should be interviewed at any one address. Out of this designated sample, which represents the total possible number of interviews, some income units were successfully interviewed and others were not. An interview was counted a success if reasonably satisfactory information was given to the income questions. In fact, in almost all cases those who answered the income questions also answered all the other questions, and very few who gave information on other aspects of their affairs were unwilling to give their incomes. Income units for whom no interview was obtained for any reason, or who gave unsatisfactory information on their incomes, are called non-respondents. The response rate for the whole sample or for any part of it, is computed by expressing the number of respondents as a percentage of the total number of income units in the designated sample.

It was not always easy to discover exactly how many income units were living at each address. If, of course, at least one successful interview was taken at a house it was usually possible to find out how many income units were living there. But in cases where there was never anyone at home when the interviewer called, or where one person came to the door and refused to enter into any discussion, we cannot say with certainty how many income units were missed. In estimating the total number of income units in the designated sample we have had to assume that the average number of income units in the addresses at which no contact was made was equal to the average number of income units at other addresses.

The weighted proportion of non-respondents in this survey was 25 per cent. This is larger than in most surveys in this country; but not very much larger. The composition of this total, in terms of the reasons for non-response, is given in Table 5, which also shows separate figures for each of the three sizes of town. It will be seen that only about half of the total non-response was due to direct refusal. First, there were 3 per cent of income units who could not be interviewed on account of their being too old or ill, or because there had recently been a death in the house. Secondly, there were 5 per cent who were said to be always out or away from home. It may be that this statement was not, in some cases, the strict truth but an excuse given to evade an interview; but there are certainly some people—especially amongst those aged 18 to 24—who can scarcely ever be found at home. As will be seen, the proportion of non-respondents from this cause was appreciably larger in the conurbations than elsewhere, and this is consistent with what we know of the faster tempo of life in the large towns.

TABLE 5

*Reasons for Non-Response, Analysed by Size of Town*

*(number of non-respondents expressed as a percentage of all possible interviews in each type of area)*

| | | *Size of town* | | |
|---|---|---|---|---|
| *Reason for non-response* | *Great Britain* | *Conurbations* | *Other urban* | *Rural* |
| Too old or ill ... ... | 3 | 4 | 3 | 2 |
| Always out or away from home ... ... | 5 | 7 | 3 | 2 |
| Direct refusal ... ... | 13 | 18 | 12 | 6 |
| Refusal by someone else | 3 | 4 | 4 | 2 |
| Income not known or not reported clearly | 1 | 1 | 1 | 2 |
| Total non-respondents | 25 | 34 | 23 | 14 |

Note. Since these figures are averages of the two strata of dwellings they are weighted to compensate for the different sampling rates in the two strata.

Direct refusals were given by 13 per cent of all income units. This figure is almost certainly larger than the figure of refusals in surveys on less sensitive subjects than income and savings. It shows a striking variation between the different sizes of town, ranging from 18 per cent in conurbations to only 6 per cent in rural districts. It is the chief factor responsible for the differences in the total rate of non-response in the three types of community. Apart from direct refusals, there were some people who could not be interviewed because others stood in their way. Sometimes people who gave interviews themselves would not allow their servants or boarders or other members of their family to be interviewed. But most of these refusals by someone else are due to one person refusing on behalf of a whole household or a whole dwelling. There is no certainty, therefore, that if our interviewers had been able to approach these people separately they would have proved willing informants. Finally, there was a small group of cases where a person was willing to give most or all of the information required but could not say what his income was, or gave unsatisfactory or incomplete income data. Under the general rule defining a successful interview these people were treated as non-respondents.

What, then, was the effect of this rather large degree of non-response on the sample ? Were the non-respondents people of any particular sort, or were they scattered amongst the population at random ? It is clear already that the response rate was associated to some extent with the type of area and the size of house within each area : it was not randomly distributed in these respects. But these variations can be largely offset by re-weighting the results. What we do not know is whether willingness to respond is associated with other characteristics, such as occupation, age, sex, income or liquid asset holdings. All that we can do is to collect together the evidence—both internal and external to the sample—on which an opinion on this question can be formed.

The first piece of evidence that may be adduced is the fact—already noted above—that, when the sample was re-weighted to take account of the marked differences in response rate in towns of different sizes, this operation had no significant effect on the distribution of some of the principal variables. This seems to suggest that the bias—if there was one—was equally spread over all types of area. Yet, if this were so, it would be a rather surprising phenomenon, in view of the very wide differences in the rates of direct refusal. There seems to be some support here for an alternative hypothesis, namely that willingness to respond to a survey is a function of a general tendency to be friendly or hostile towards strangers. It has often been remarked that people are less friendly in the large towns than in the country; and this may be a general rule for all classes and types of people within these areas, and the response rates may have no special association with income and wealth.

With a view to throwing some light on variations in the response rate, attempts were made in this survey to collect some basic information about all the income units for whom complete interviews were unobtainable. It was hoped that interviewers would be able to find out at least the age group and sex of the respondents, and perhaps even the occupation in some cases. Instructions were issued to the effect that as much as possible of the classificatory data on the front page of the questionnaire should be collected. But the interviewers were not very successful in this part of their assignment and comparatively little information of this sort was in fact obtained. It is not possible, therefore, to draw much from this internal evidence about the characteristics of the non-respondents.

We come, then, to the external evidence on the representativeness of the sample. Although no amount of outside comparisons can prove conclusively the absence of bias—unless of course all the information sought in the survey is already known from independent sources—it is some reassurance if a sample is found to conform with the population in a number of major characteristics; and especially if they are characteristics which are likely to be associated with the variables under observation. Unfortunately, we are hampered in these comparisons by the fact that the sample was not drawn from the whole population but is limited to the private households. The outside data on which our comparisons are based refer, in almost all cases, to the whole population of Great Britain, including the 2½ million people who live in institutions.

One important set of comparisons can be made with data drawn from the results of the 1951 Population Census. The census does not recognise the category of ' income units ', but some estimates can be made of the distribution of income units according to sex, age, occupation and industry from the tables of males and females classified by age and marital status. Each male person of 18 or over is, according to our definition, the head of an income unit; and females, who are of the same age and unmarried, are also heads of income units. Some difficulties arise from the fact that in the survey we assumed that a man and woman living together as man and wife were in fact married, while in the census we have a record of—presumably—the number of males and females who are legally married, irrespective of whether they are living with their spouses. Other marginal discrepancies occur as a result of the survey's ' amalgamation ' of a few single adults, who had no independent means of support, with their relatives; and as a result of the survey's treatment of the wives of servicemen as, in effect, unmarried.

In the following comparison, no account has been taken of these differences of definition or practice. In the estimates of the numbers of income units of each type, compiled from *One Per Cent Sample Tables*, each male person aged 18 or over has been treated as a head of income unit and each female of similar age, whose marital status was recorded as single, widowed or divorced, has been treated similarly. The tables do not provide exact breakdowns of occupations and industries by all three required attributes—sex, age and marital status—but reasonable estimates can be made in most cases. The results of the comparison are summarised in Table 6.

No information is yet published on the composition of the institutional population by age, sex and marital status and consequently the census figures shown here necessarily include them. It was possible, however, to adjust the data in one respect by removing the members of the armed forces. Without this adjustment the proportion of male income units aged 18 to 24 would have been even larger than it is; and the distributions of males by occupation and industry would have been somewhat different.

In spite of the unsatisfactory nature of this comparison, a study of the figures in Table 6 reveals a remarkable degree of correspondence between

TABLE 6

*Comparison of Survey Results with Estimates Derived from the 1951 Population Census (percentages of total civilian male and female heads)*

| *Characteristic of income unit* | *Income units with male heads* | | *Income units with female heads* | |
|---|---|---|---|---|
| | *Census* | *Survey* | *Census* | *Survey* |
| All income units with civilian heads ... | 100.0 | 100.0 | 100.0 | 100.0 |
| **Age of head** | | | | |
| 18—24 ... ... ... ... ... | 11.2 | 9.5[1] | 21.0 | 21.4 |
| 25—34 ... ... ... ... ... | 20.5 | 21.0 | 11.0 | 9.8 |
| 35—44 ... ... ... ... ... | 22.1 | 21.7 | 10.4 | 9.2 |
| 45—54 ... ... ... ... ... | 19.3 | 19.7 | 12.5 | 15.9[1] |
| 55—64 ... ... ... ... ... | 13.7 | 14.1 | 15.7 | 15.5 |
| 65 and over ... ... ... ... | 13.2 | 14.0 | 29.4 | 28.2 |
| **Occupation of head** | | | | |
| Self-employed ... ... ... ... | 7.9 | 7.6 | 2.4 | 2.6 |
| Managers and technical ... ... | 9.7 | 7.2[1] | 5.6 | 3.3[1] |
| Clerical and sales... ... ... ... | 9.0 | 9.5 | 14.5 | 19.7[2] |
| Manual workers ... ... ... ... | 59.4 | 62.8[1] | 29.2 | 26.4 |
| Retired and unoccupied ... ... | 14.0 | 12.9 | 48.3 | 48.0 |
| **Industry of head** | | | | |
| Agriculture ... ... ... ... | 5.6 | 5.2 | 1.1 | 1.6 |
| Mining and quarrying ... ... ... | 4.9 | 5.7 | 0.1 | 0.2 |
| Manufacture—metal ... ... ... | 18.5 | 16.2[1] | 5.1 | 4.0 |
| Manufacture—other ... ... ... | 14.7 | 15.2 | 12.3 | 12.8 |
| Building and contracting ... ... | 7.5 | 8.6 | 0.4 | 0.5 |
| Gas, water and electricity ... ... | 2.0 | 2.1 | 0.3 | 0.3 |
| Transport and communications ... | 8.8 | 10.7[1] | 1.9 | 2.5 |
| Distribution ... ... ... ... | 8.9 | 8.5 | 8.3 | 8.8 |
| Professional and other services... ... | 9.5 | 9.4 | 19.7 | 17.6 |
| Public administration ... ... ... | 5.6 | 5.5 | 2.5 | 3.7 |
| Retired and unoccupied ... ... | 14.0 | 12.9 | 48.3 | 48.0 |

[1] Survey figures marked thus show a significant difference from the census figures. Differences as great as these would occur less than one in twenty times in random samples drawn from a population with the characteristics indicated by the census figures.

[2] A difference as great as this would occur less than one in a hundred times in random sampling.

the census and survey distributions. Out of 42 separate estimates in the table, eight show discrepancies which are significant ‘ at the 5 per cent level ’. Only one of the differences is significant at the 1 per cent level. For some of the figures which are significantly different explanations can be suggested. The unduly low proportion of male heads aged 18 to 24 in the sample is probably connected with the fact that young men of this age are very often out and away from home. By the same token, however, one would expect to find in the sample a lower proportion of females of the same age group; but this is not so. There is a peculiar deficiency in the sample of females in the ages from 25 to 44, and an unwanted surplus between 45 and 54. It is conceivable that a disproportionately large number of women of this age group live in institutions—as domestic servants, for example—but there is no reliable evidence to support that view.

The discrepancies in the occupational section of the table are not very remarkable in view of the difficulties of securing comparability of the two occupational classifications. For both males and females the census shows a larger proportion of managers and technical employees. This group has ill-defined limits and in the rearrangement of the census data for this comparison all persons classified as 'Operatives—social classes I and II ' were included under this heading, with the exception of clerks and typists. It is not unlikely, therefore, that a good many people who would have been classified as manual workers in the survey were classified as managers or technical employees by this criterion. This would help to explain the surplus of male manual workers in the sample. The proportion of female manual workers is already rather too low, and it would not be helpful to suggest that it should really be lower. But in the case of the females there is a similar difficulty in drawing the line between ' clerical and sales ' workers and the ' managers and technical ' category. In view of the special approximations that were used in compiling the estimates of the distribution of female heads of income units, the differences between the census and survey figures are not very strong evidence of bias in the survey. The distributions by industry show, for both sexes, a high degree of correspondence.

So far, the tests with outside figures are comparatively reassuring. From the results of the survey itself we know that there are important associations between income and occupation and between wealth and age; and if the sample is reasonably representative in respect of age and occupation it is not likely to be completely out of alignment for the related variables. But there are some disturbing features. Firstly, it must now be confessed that, although the degree of correspondence of census and sample within the two sex groups is quite good, there is a curious discrepancy between their estimates of the proportions of male and female heads of income units. According to the census the proportion of income units with male heads is 70 per cent : according to the survey it is 75 per cent. This difference is significant by any standard. To what can it be attributed ?

There are two possible explanations of the apparent deficiency of female heads of income units in the sample. The first is that a disproportionately large number of single women live in institutions. It is quite likely that a majority of the income units in institutions—which include residential hotels and boarding-houses as well as institutions like hospitals, schools and homes for the elderly—are single women; but the proportion would have to be very large indeed, perhaps as much as three-quarters, to account entirely for the deficiency of single females in the survey sample.

Another possible explanation is that some single women were treated in the survey as if they were married. This is clearly a delicate point; and interviewers were obliged to take the information on family relationships as it was given to them. The possibility cannot, however, be excluded that the survey gives a more reliable reflection of the true situation in the population in this respect than the census.

One check can be made on the sex composition of the sample which excludes the influence of both these factors. There is a census table in which heads of private households are analysed by sex and marital status. According to this table, households of which the head is a single, widowed or divorced women constitute 17.9 per cent of all private households. In the survey, the proportion of heads of households who were females was 17.4 per cent. The correspondence is extremely close, and it suggests that the difference between the census and survey estimates of the proportion of single women in the population is due to differences of definition—such as those mentioned above—rather than to any bias in the survey sample.

Several comparisons of the survey results with outside estimates have been made in previous articles in this series. Many of these are reassuring; but there are one or two comparisons which indicate a definite deficiency in the survey sample. Both in the comparison of the components of personal income and in the comparison of the survey's estimates of total liquid asset holdings there is evidence of a bias towards the under-representation of property ownership and property income. This bias does not necessarily affect appreciably the distribution of income by ranges of size, nor even the frequency distribution of liquid asset holdings; but it does affect the estimates of aggregate or average holdings of assets. It is possible that the deficiency is caused by the abstention from the survey of a quite small class of persons whose incomes are derived mainly from the ownership of capital.

To summarise this section, it may be said that, from such evidence as can be adduced, the existence of a large volume of non-response in this survey does not seem seriously to have distorted the sample in respect of its composition by age, occupation, industry and total income. The evidence about discrepancies in sex composition is inconclusive. The one major deficiency is in the amount of property income recorded and, parallel with this, in the volume of liquid assets owned.

### *Sampling Error*

When a sample is drawn at random from a larger group—called the population—the characteristics of the sample will rarely correspond exactly with those of the population. The difference between the mean value—for example—of the population and the mean value shown by the random sample is the sampling error. When the characteristics of the population are known, it is possible to predict the standard deviation of the means of samples of a given size about the mean of the population. This standard deviation is called the standard error of sampling. If the original population is distributed fairly symmetrically around a single mode, and the number of units in the sample is not too small—a hundred may be sufficient—the distribution of the means of the samples will aproximate to the theoretical ' normal ' distribution. In those circumstances, 95 per cent of the sample means will lie within a range of twice the standard error on each side of the population mean; and 99 per cent of them will lie within a range of three times the standard error from the same point.

In practice, of course, we do not usually know the characteristics of the population, but we are concerned to estimate them from the sample. It is of no direct interest to know the probability of drawing a sample with a mean of given size from a known population : what is required is an estimate of the degree of reliability with which we can estimate that the population value lies within certain limits on each side of the sample value. This is a different logical process—known as 'inverse' probability—and it is generally based on the assumption that all population values are equally probable *a priori*, *i.e.*, before the sample is drawn. Once the sample has been drawn, we can ascertain from which kind of population such a sample would have been produced with the greatest probability, and we can infer that this gives the most ' likely ' estimate of the true population value. On similar assumptions, if we choose limits of twice the standard error on each side of an estimated mean value, we can predict that in 95 samples out of 100, drawn in the same manner, we shall be correct in estimating that the true population value lies with these limits.

The standard error of an estimate based on a simple random sample can be calculated by relatively simple methods. In this survey, however, the sample was not of this simple type. A precise calculation of the standard error of each of the many estimates derived from the sample would require more effort than was put into the entire analysis of the results. It is reasonable to assume, however, that measurements in a common field of study will show similar tendencies, and that estimates of the standard errors of a few typical measurements will provide an indication of the standard errors to be anticipated for others. In particular, we might expect that there would be a tendency for the actual standard errors to deviate from the standard errors of random sampling by a broadly similar proportionate amount.

The standard error of an estimate from a multi-stage sample can be estimated, with sufficient degree of accuracy for practical purposes, from the variability shown by the first-stage units. This variability is an amalgam of the actual variability of these units in the population and the variability of the sample estimates of their values, based on the samples of second-stage units drawn from them. When the first-stage units are stratified it is necessary to have estimates for each stratum separately. In this survey, for reasons given earlier, the stratification of first-stage units was pushed to the point at which only one unit was drawn from each stratum. In such circumstances no estimate of variability within strata could be made, and in order to overcome this difficulty it was necessary to pair up strata. Pairs were selected by reversing the original process of division, and putting together, so far as possible, those strata which would have been united if it had been the original intention to draw two first-stage units from each stratum. To some extent this was a matter of judgement; but the judgement was made on *a priori* grounds and without reference to the actual results of the survey or the effect of the decisions on the estimates of standard errors.

The differences between each pair of first-stage units provided estimates of the variability between the first-stage units and, hence, by suitable weighting of the strata, of the total standard errors of sampling. The actual formulae employed are given in a note at the end of this article. The estimates obtained in this way are probably biased upwards, since the average variation between pairs of first-stage units that were originally drawn from two different strata will be greater—provided that the last stage of stratification was at all effective—than the variation between pairs of units selected at random from undivided strata. However, from tests of correlation between the three principal variables and the industrialisation index—which was the chief factor used in the final stage of stratification—it appears doubtful whether the last stage of stratification was in fact particularly effective.

Estimates of the actual standard errors of three variables and of four proportions are given in Table 7, column (2). Each of these relates to figures derived from the whole sample. The meaning of these standard errors is, as indicated above, that the mean value of the population can be expected, with 95 per cent confidence, to lie within a range of twice the standard error on each side of the mean value registered by the sample. Thus, the true mean of gross income can be expected, with this degree of confidence, to lie between £400 and £448 approximately; and the true proportion of car owners should be somewhere between 6.7 and 9.7 per cent.

TABLE 7

*Estimated Standard Errors of Selected Characteristics in the Total Sample*

| *Description of characteristic* | *Mean or proportion given by sample* (1) | *Estimated standard error of actual sample* (2) | *Standard error of simple random sample of same size* (3) | *Standard error from unstratified first-stage units* (4) | *Col. (2) as per cent of:* | |
|---|---|---|---|---|---|---|
| | | | | | *Col (3)* (5) | *Col (4)* (6) |
| **Mean amount per income unit** | £ | £ | £ | £ | | |
| Gross income ... | 424 | 12.1 | 11.5 | 12.7 | 105 | 95 |
| Liquid asset holdings | 225 | 24.7 | 21.3 | 26.8 | 116 | 92 |
| Total saving ... | +4 | 3.9 | 3.4 | 4.1 | 115 | 95 |
| **Proportion of income units who:** | % | % | % | % | | |
| Own a car ... ... | 8.2 | 0.76 | 0.54 | 0.85 | 141 | 89 |
| Own a television set | 7.2 | 0.61 | 0.51 | 0.79 | 120 | 77 |
| Expect income to rise | 26.8 | 1.12 | 0.87 | 1.2 | 129 | 93 |
| Expect to save ... | 27.1 | 1.20 | 0.88 | 1.6 | 136 | 75 |

The table also shows, in column (3), the standard error that would be applicable to a sample of the same total size drawn directly and at random from the population. It is interesting to compare this estimate of the standard error with the estimated standard error of the sample actually employed. The difference between the two is primarily due to the two-stage structure of the actual sample. Some effect may also be produced by the use of clusters of income units (in each rateable unit) in the actual sample; but this depends on the existence of a positive or negative association between income units within clusters. In general, this association is not very marked, and it is safe to ascribe most of the difference between the two estimates of the standard error—in columns (2) and (3)—to the two-stage structure of the actual sample.

An inspection of the figures suggests that the effect of a two-stage design is greater in the case of attributes than in the case of variables. As can be seen from column (5), the actual standard error of mean gross income is only 5 per cent greater than the simple random standard error. For the other two variables the difference is somewhat greater; but none of these differences are as great as those shown by the proportions. The actual standard errors of the proportions are between 20 and 40 per cent greater than their simple random standard errors.

Why should the precision of estimates of proportions be thus reduced by two-stage sampling to a greater degree than the precision of estimates of the means of variables ? The answer must be either that there is a greater relative variability between rating areas in the incidence of attributes of this kind than in the means of economic variables, or that the stratification of the rating areas was more effective in the latter case than in the former.[1] The effectiveness of the first-stage stratification can be tested by comparing the variability within strata with the overall variability of the first-stage units, irrespective of stratification. The results of such a comparison are shown in column (6) of the table. From this it will be seen that stratification reduced the degree of variability between the rating areas by comparatively little in the case of means of variables but by much more in the case of proportions. The conclusion must be that the rating areas are fairly homogeneous in respect of variables and that the methods of stratification used in this survey were not particularly effective in making them more homogeneous; while, in the case of attributes, the areas vary much more greatly amongst themselves, despite the fact that this source of variability was much reduced by stratification. What this means in practice is that in this country there is much less variability between one area and another in average income or wealth than in the proportion of people who own cars, or television sets or have one or other point of view. It would, however, be surprising to find big variations between areas in such characteristics as the proportions of males and females, or the proportions of persons of particular age groups.

No estimates have been made of the standard errors of figures derived from sub-groups of the sample. It should be reasonable to assume, however, that estimates based on smaller numbers will be subject to sampling errors which increase inversely with the square root of the number in the sample.

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[1] It is possible that some of the variability between areas is due to variability between interviewers, since, in most cases, only one interviewer worked in each area. But the argument of this paragraph would be affected only if there was reason to believe that the influence of interviewer variability was greater in the case of attributes than in the case of variables. This might be true of attributes derived from opinion questions, but there seems to be no *a priori* reason why it should be true of other attributes.

Thus, an estimate based on 500 cases will have a standard error about twice as large as one which is based on 2,000 cases, provided that the distribution of the attribute or variable is similar in the two samples.

Sampling error, as we have seen, is only one of several possible sources of error in a sample survey. Because it is a form of error which can be treated mathematically and with an impressive volume of theoretical argument, it sometimes takes up too much of the stage. It is a fair guess that more serious errors are caused by reporting and processing errors than by sampling fluctuations. Non-sampling errors can arise, and do arise, in censuses and other official inquiries, as frequently and with as serious effects, as in sample surveys. In assessing the accuracy of a survey estimate each possible source of error must be taken into account. Some results are more likely to be affected by response bias; others by sampling errors; others by errors of reporting or processing. It is hoped that this discussion will have provided some basis for judging the relative importance of the different sources of error in each case.

## NOTE ON ESTIMATION OF STANDARD ERRORS

The standard errors of the actual sample, shown in Table 7, column (2), have been calculated on the following formula:

$$\text{Standard error} = \sum_{i=1}^{i=\lambda} \left(\frac{N_i}{N}\right)^2 \frac{1}{m_i(m_i-1)} \sum_{j=1}^{j=m_i} (\bar{y}_{ij} - \bar{\bar{y}}_i)^2$$

Where:

$N$ = total population of Great Britain.

$N_i$ = population in first-stage stratum $i$.

$\lambda$ = number of first-stage strata.

$m_i$ = number of areas sampled in stratum $i$.

$\bar{y}_{ij}$ = sample mean of a variable or proportion in area $j$ of stratum $i$.

$\bar{\bar{y}}_i$ = sample means of a variable or proportion in stratum $i$ (based on the results for the $m_i$ areas drawn from stratum $i$).

This formula takes no account of:

(*a*) the effect of sampling from a finite number of areas in each stratum.

(*b*) the within-area variance, except insofar as it is already incorporated in the between-area variance.

These two influences will work in opposite directions; but, on balance, the standard error, as estimated on the above formula, will tend to be slightly greater than the true standard error.

For the five towns which were sampled at one stage, the within-stratum variance was based on the variance of income units within towns, there being no between-town variance. For these towns the term:

$$\frac{1}{m_i(m_i-1)} \sum_{j=1}^{j=m_i} (\bar{y}_{ij} - \bar{\bar{y}}_i)^2$$

was replaced by

$$\sum_{k=1}^{k=2} \left(\frac{N_{ik}}{N_i}\right)^2 \frac{1}{n_{ik}(n_{ik}-1)} \sum_{h=1}^{h=n_{ik}} (y_{ikh} - \bar{y}_{ik})^2$$

where

$N_{ik}$ = Estimated population of stratum $k$ within town $i$.

$N_i$ = Population of town $i$.

$n_{ik}$ = Number of income units interviewed in stratum $k$ of town $i$.

$y_{ikh}$ = Sample value of the $h$th income unit in the $k$th stratum of the $i$th town.

$y_{ik}$ = Mean sample value for all income units interviewed in the $k$th stratum of town $i$.

H. F. Lydall

# THE UNITED STATES RECESSIONS OF 1948–9 AND 1953–4

Internally, the U.S. recessions of 1948–9 and 1953–4 have been rather similar. But the external effects have been markedly different. While the 1949 recession led to serious balance of payments crises in many countries, this time an almost equivalent fall in U.S. industrial production has taken place without causing any such acute difficulties for the rest of the world. A discussion of the external recession effects, and the general changes in the U.S. balance of payments, will be preceded by a brief comparison of the internal aspects of the two recessions and the economic climate which surrounded them.

By 1948 the major change from war to peace had taken place in the American economy. Government purchases of goods and services had fallen from 43 per cent of the G.N.P. in 1945 to 13 per cent in 1948. The private sector had expanded remarkably to take up this fall in government demand. Pent-up war-time demand increased total personal consumption (mainly in durable goods expenditure which more than doubled) and private investment which nearly trebled. By 1948 the exceptional rate of expansion in the private sector was slowing up, but both consumption and investment were still rising quite strongly in the early part of the year. But in the second quarter of 1948 there was a significant increase in personal savings and the ratio of savings to disposable income rose steeply in the middle of the year. This, combined perhaps with the continued rise in prices,[1] slowed up the rate of expansion.

In mid-1953 heavy defence commitments had again increased the Government's share to 28 per cent of the national product. This change, like the earlier switch from a controlled war economy, had considerable expansionary force. The rate of inventory accumulation, which had been exceptionally high following the post-Korean boom in 1951, fell sharply at the end of that year to a very low level by mid-1952. In addition the steel strike of 1952 caused shortages in metal-using industries which brought the rate of inventory accumulation down to even lower levels than they might otherwise have reached. As consumption expenditures rose rapidly (particularly in consumer durables) and businesses attempted to rebuild stocks, industrial production increased sharply in the second half of 1952. But the rate of increase in production appears to have outstripped the rate of increase in consumption, which began to tail off early in 1953, and stocks began to mount up again. This time, however, there was no violent change in the ratio of savings to disposable income, which fell slowly, and not very much, from mid-1952 to mid-1953. Morecver, unlike 1947–8, prices had been falling prior to the current recession.[2]

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[1] In the eighteen months prior to mid-1948 retail prices rose by 14 per cent and wholesale prices by 19 per cent.

[2] Wholesale prices fell by 8 per cent from their peak in 1951 but were roughly stable after mid-1953. Retail prices reached their peak in early 1952 and had been more or less stable since.

*The recessions compared*

Table 1 shows the percentage changes in a few of the more important economic indicators[1] during the two recessions. It will be noted that industrial production fell by about 8 per cent in both recessions, while the G.N.P. fell by only half as much. The decline in the industrial sector of the economy was offset to some extent by contrary movements in other sectors (particularly government and household). Within the industrial sector, the greatest changes have been in the production of durable goods. Thus, during the 1949 recession, production of non-durable manufactures fell by 7 per cent, but the production of durable manufactures fell by 25 per cent. This time the difference is not so great; whereas production of non-durable manufactures has fallen 5 per cent, production of durable manufactures has fallen 13½ per cent. There were even greater fluctuations in some of the earlier stages of production. For example, in the latest recession there has been a 23 per cent fall in the output of steel ingots[2] and primary metals as a whole.

TABLE 1

*Changes in Major Indicators During the Two Recessions*

| | *Percentage change 4th qtr. 1948 to 4th qtr. 1949* | *Percentage change 2nd qtr. 1953 to 1st qtr. 1954* |
|---|---|---|
| Gross National Product ... ... ... | —3.8 | —3.8 |
| Gross Private Domestic Investment ... | —32.1 | —20.4 |
| Total Fixed Investment ... ... ... | —5.5 | —3.6 |
| Total Personal Consumption Expenditure ... | +2.4 | —0.4 |
| Expenditure on Durable Goods ... ... | +11.1 | —7.5 |
| Expenditure on non-Durable Goods ... | —2.3 | —0.9 |
| Expenditure on Services ... ... ... | +5.4 | +3.3 |
| Industrial Production ... ... ... ... | —7.7 | —8.8 |
| Wholesale Prices ... ... ... ... | —6.3 | +1.0 |

Source: United States Department of Commerce, *Survey of Current Business.*

The reduction in *gross private domestic investment* was smaller in the recent than in the 1949 recession—20 per cent as against 32 per cent. As total (private) fixed investment[3] fell very little in both recessions, the decline in gross private domestic investment was largely accounted for by inventory falls. This can be seen clearly in Chart II. The liquidation of inventories in 1949 was greater than would otherwise have been the case because of the steel strike of that year, which, similar to 1952 caused an involuntary depletion of stocks in the durable goods industries. On the other hand, the

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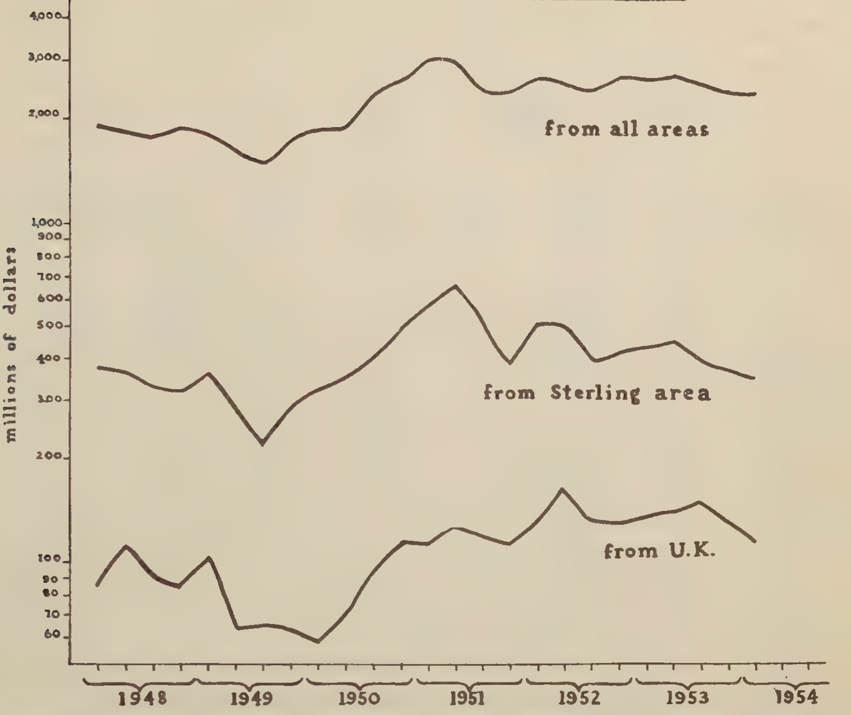
[1] These data must be used with care. The changes for the current recession have been calculated from preliminary figures which may differ significantly from the 'final' figures. Also, the current recession has, as far as the latest quarterly figures indicate, not yet ended, although there are signs from the monthly figures that the upturn may have commenced. Further, it will be seen that the percentage changes for the current recession cover only three as against four quarters for the 1949 recession.

[2] The steel industry was about 25 per cent under 'capacity' but the latest preliminary monthly returns show a reduction in this 'surplus capacity'.

[3] Gross private domestic investment = total (private) fixed investment ± inventory changes.

I. U.S.A. Imports of Merchandise



decision to reduce military production rates probably had an adverse effect upon the inventory position during the current recession. In describing both recessions as inventory adjustments care must, however, be exercised as the figures given for inventory changes are in monetary terms. Firms often revalue their inventories as prices change, but they do not necessarily revalue or revalue to the same extent (or to the extent of the price changes). It is impossible, therefore, to calculate real inventory changes with any degree of accuracy. Taking into account the fall in wholesale prices during 1949 and their rise during 1953–4, one may hazard a guess that real inventory changes were smaller in 1949 than this time.

Although total fixed investment was relatively stable, the changes in one of its components—new construction—are of some interest. (See Chart II or Table 2.) During the first recession it was one of the first indicators to fall. It was also the first to rise again, mainly because of an increase in new residential construction.[1] In the present recession, new construction showed a small dip during the third quarter of 1953, but has increased ever since, thus partly offsetting the decline of investment in producer's durables.

[1] The increase in new residential construction followed a reduction in the cost of new housing. At the same time an amendment to the National Housing Act permitted smaller down-payments and longer repayment periods for mortgages. Also mortgage interest rates fell at this time.

## II. Private Domestic Investment

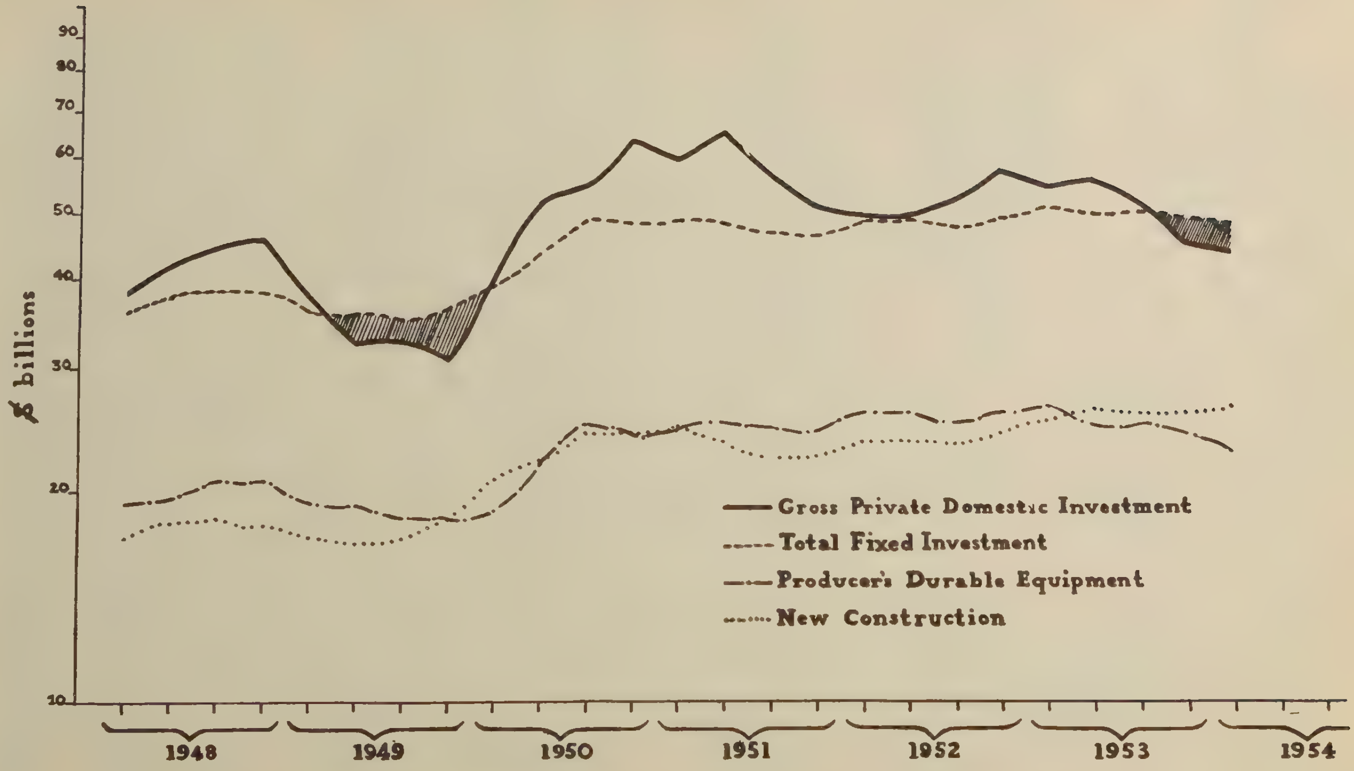


TABLE 2. *Changes in the Gross National Product and in certain other indicators, 1948–54*

| | | *Gross National Product* | | | | | | | | *Index of Industrial production (Qtly. av. of monthly figures) 1947–49 100* | *Index of Wholesale prices (Qtly. av. of monthly figures) 1947–49 100* | *Business sales ($ billions)* | *Unemployment (thousands)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Seasonally adjusted quarterly totals at annual rates (in billions of dollars)* | | | | | | | | | | | |
| | | *G.N.P. Total* | *Personal consumption expenditures* | *Gross Private Domestic Investment* | | | | *Net foreign investment* | *Govt. purchases of goods and services* | | | | |
| | | | | *Total* | *New construction* | *Producer's durable equipment* | *Change in business inventories* | | | | | | |
| 1948 | I | 248.2 | 174.6 | 38.4 | 17.0 | 19.1 | 2.4 | 3.6 | 31.6 | 103 | 103.2 | 109.1 | 2,381 |
| | II | 257.8 | 177.5 | 42.1 | 17.9 | 19.6 | 4.7 | 2.6 | 35.6 | 103 | 103.9 | 110.8 | 2,046 |
| | III | 263.2 | 179.7 | 44.6 | 18.2 | 20.5 | 5.9 | 0.0 | 38.9 | 104 | 105.9 | 113.7 | 2,022 |
| | IV | 267.0 | 179.8 | 45.7 | 17.8 | 20.7 | 7.2 | 1.2 | 40.3 | 104 | 104.4 | 110.8 | 1,805 |
| 1949 | I | 260.6 | 178.7 | 37.5 | 17.1 | 19.2 | 1.2 | 1.2 | 43.2 | 99 | 101.6 | 106.0 | 3,017 |
| | II | 258.6 | 180.2 | 32.6 | 16.8 | 19.1 | —3.2 | 1.3 | 44.5 | 95 | 99.0 | 105.4 | 3,361 |
| | III | 256.9 | 180.5 | 32.7 | 16.9 | 18.3 | —2.6 | 0.2 | 43.6 | 96 | 98.2 | 103.4 | 3,712 |
| | IV | 256.8 | 183.0 | 31.0 | 18.2 | 18.2 | —5.4 | —0.5 | 43.3 | 96 | 97.8 | 101.3 | 3,491 |
| 1950 | I | 265.0 | 185.1 | 40.2 | 20.7 | 18.7 | 0.7 | —1.7 | 41.5 | 100 | 98.2 | 105.7 | 4,429 |
| | II | 280.3 | 189.7 | 52.0 | 22.0 | 21.7 | 8.3 | —1.6 | 40.3 | 109 | 99.4 | 114.3 | 3,319 |
| | III | 295.6 | 203.8 | 54.7 | 24.1 | 24.7 | 5.8 | —3.2 | 40.3 | 118 | 105.1 | 127.0 | 2,685 |
| | IV | 306.3 | 199.6 | 63.3 | 24.1 | 24.1 | 15.1 | —2.7 | 46.1 | 121 | 109.7 | 125.2 | 2,136 |
| 1951 | I | 319.6 | 210.2 | 59.9 | 24.6 | 24.4 | 10.9 | —2.7 | 52.2 | 122 | 116.0 | 137.9 | 2,352 |
| | II | 330.4 | 204.8 | 65.5 | 23.4 | 25.0 | 17.1 | —0.2 | 60.2 | 122 | 115.8 | 133.9 | 1,778 |
| | III | 332.5 | 206.6 | 57.2 | 22.3 | 24.5 | 10.4 | 1.1 | 67.5 | 118 | 113.8 | 129.3 | 1,680 |
| | IV | 336.9 | 210.9 | 51.6 | 22.3 | 24.3 | 5.0 | 2.8 | 71.6 | 119 | 113.6 | 132.6 | 1,706 |
| 1952 | I | 340.4 | 213.7 | 50.4 | 23.3 | 25.6 | 1.5 | 2.1 | 74.1 | 121 | 112.6 | 134.1 | 1,981 |
| | II | 345.1 | 217.2 | 49.6 | 23.4 | 25.6 | 0.7 | 0.5 | 77.7 | 119 | 111.5 | 135.7 | 1,674 |
| | III | 345.3 | 217.2 | 52.3 | 23.1 | 24.9 | 4.2 | —2.0 | 77.8 | 122 | 111.9 | 134.4 | 1,661 |
| | IV | 361.1 | 224.4 | 57.9 | 23.9 | 25.5 | 8.5 | —1.6 | 80.4 | 132 | 110.5 | 144.8 | 1,371 |
| 1953 | I | 363.9 | 227.7 | 54.9 | 25.0 | 26.2 | 3.7 | —2.1 | 83.4 | 134 | 109.9 | 146.0 | 1,785 |
| | II | 369.9 | 230.8 | 55.9 | 25.9 | 24.6 | 5.4 | —3.3 | 86.6 | 136 | 109.6 | 149.6 | 1,483 |
| | III | 367.2 | 231.2 | 52.4 | 25.6 | 24.8 | 2.0 | —1.8 | 85.4 | 135 | 110.8 | 147.2 | 1,345 |
| | IV | 360.5 | 229.7 | 45.5 | 25.7 | 24.0 | —4.2 | —0.6 | 86.0 | 129 | 110.0 | 143.0 | 1,480 |
| 1954 | I | 355.8 | 230.5 | 44.5 | 26.0 | 22.7 | —4.2 | —1.1 | 81.9 | 124 | 110.7 | 139.7 | 2,867 |

*Source* : U.S. Department of Commerce *Survey of Current Business* and the *Federal Reserve Bulletin.*

The changes in *personal consumption expenditure* are shown in Table 3. The remarkable buoyancy of *total* consumption expenditure is mainly accounted for by a steady rise in expenditure on services. Expenditure on non-durable goods fell in both recessions. But whereas expenditure on durable goods during the current recession has fallen by 7½ per cent, it rose by 11 per cent during the 1948–9 recession.

The curious contra-cyclical rise in durable goods expenditure in the first recession requires some comment. Following a considerable increase from the end of the war, this expenditure *fell* by 5 per cent between the third quarter of 1948 and the first quarter of 1949. Thereafter, despite a deepening of the recession, expenditures *rose* sharply. Increased purchases of cars, which had previously been in short supply, and of television sets following a reduction in price, seem to have been important causes. In this recession, the decline of 7½ per cent came after a sustained rise in expenditure of about 20 per cent in the preceding year. This time there have been no factors at work to cause any rise in this expenditure *during* the recession.

From the last three columns of Table 3 it would appear that a rise in the ratio of savings to disposable income contributed to the onset of the 1948–9 recession, and its decline to the hastening of the subsequent recovery : while in the current recession the ratio remained fairly steady somewhat above the pre-recession level.

The high level of total personal consumption expenditures in this recession can perhaps partly be explained by the fact that the fall in income payments through under-employment has been almost entirely offset by a decline in personal income tax liability and by a rise in unemployment compensation. Disposable income has been rising slightly throughout the recession and must be counted as one of the factors that offset the fall in business investment.

The decline in fixed and inventory investment of businesses was also offset in the *public sector*. Government purchases of goods and services were twice as high in 1953 as in 1949 and increased by almost 4 per cent at the onset of the current recession (compared with a rise of 6 per cent in the early stages of the 1949 recession). As Government outlay in 1953 was about $5–6 billion higher than in the previous year, it compensated for some of the disinvestment in stocks. In the first quarter of 1954 Government outlay decreased, mainly as a result of the decision to reduce military production rates (see Table 2).

The net effect of Government activity on the rest of the economy, as shown in Table IV, was contra-cyclical in both recessions. In the current recession there were actual deficits in the fourth quarter of 1953 and the first quarter of this year,[1] but the contra-cyclical effects were less than in the 1949 recession. It would appear that in neither recession was there any conscious attempt to bring about a deficit, but the U.S. fiscal system acts as

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[1] There was a budget deficit of $3.5 billions in the first quarter of 1950 but by this time the upturn had commenced.

TABLE 3

*U.S.A. Personal Consumption Expenditures, Personal Saving and Disposable Income*[1]

| | | *Total Consumption Expenditure* $ *Billions* | *Expenditure on durable goods* $ *Billions* | *Expenditure on Non-durable goods* $ *Billions* | *Expenditure on Services* $ *Billions* | *Personal Saving* $ *Billions* | *Disposable Income* $ *Billions* | *Ratio of Personal Saving to Disposable Income* % |
|---|---|---|---|---|---|---|---|---|
| 1948 | I ... | 174.6 | 22.1 | 100.2 | 52.3 | 5.2 | 179.8 | 2.9 |
| | II ... | 177.5 | 23.4 | 100.6 | 53.5 | 10.3 | 187.7 | 5.5 |
| | III ... | 179.7 | 23.5 | 101.4 | 54.8 | 13.3 | 193.0 | 6.9 |
| | IV ... | 179.8 | 22.5 | 101.4 | 55.9 | 13.0 | 192.8 | 6.7 |
| 1949 | I ... | 178.7 | 22.4 | 100.1 | 56.3 | 10.1 | 188.8 | 5.3 |
| | II ... | 180.2 | 23.6 | 99.6 | 57.0 | 7.1 | 187.3 | 3.8 |
| | III ... | 180.5 | 24.5 | 98.1 | 57.9 | 5.6 | 186.1 | 3.0 |
| | IV ... | 183.0 | 25.0 | 99.1 | 58.9 | 3.9 | 186.9 | 2.1 |
| 1950 | I ... | 185.1 | 26.0 | 98.6 | 60.4 | 13.9 | 199.0 | 7.0 |
| 1952 | I ... | 213.7 | 26.0 | 117.2 | 70.5 | 15.0 | 228.7 | 6.6 |
| | II ... | 217.2 | 27.4 | 118.0 | 71.8 | 14.5 | 231.7 | 6.3 |
| | III ... | 217.2 | 25.1 | 118.7 | 73.3 | 19.4 | 236.6 | 8.2 |
| | IV ... | 224.4 | 28.2 | 121.1 | 75.1 | 18.6 | 243.0 | 7.7 |
| 1953 | I ... | 227.7 | 30.2 | 121.2 | 76.3 | 17.7 | 245.4 | 7.2 |
| | II ... | 230.8 | 30.3 | 119.6 | 80.9 | 19.6 | 250.4 | 7.8 |
| | III ... | 231.2 | 30.3 | 118.6 | 82.3 | 20.0 | 251.2 | 8.0 |
| | IV ... | 229.7 | 28.0 | 118.7 | 83.0 | 21.5 | 251.2 | 8.6 |
| 1954 | I ... | 230.5 | 28.0 | 118.8 | 83.6 | 21.8 | 252.3 | 8.6 |

Source : U.S. Department of Commerce, *Survey of Current Business.*

[1] Seasonally adjusted quarterly totals at annual rates.

TABLE 4

*United States Budget Revenue, Expenditure and Surplus* (+) *or Deficit* (—)[1]

| | | *Adjusted Budget Revenue*[2] $ *Billions* | *Adjusted Budget Expenditure*[3] $ *Billions* | *Adjusted Budget Surplus*(+) *or Deficit* (—) $ *Billions* |
|---|---|---|---|---|
| 1948 | III ... ... | 60.2 | 48.7 | +11.5 |
| | IV ... ... | 59.6 | 50.2 | + 9 4 |
| 1949 | I ... ... | 55.8 | 53.5 | + 2.3 |
| | II ... ... | 55.2 | 54.6 | + 0.6 |
| | III ... ... | 56.8 | 55.0 | + 1.8 |
| | IV ... ... | 56.5 | 55.5 | + 1.0 |
| 1952 | IV ... ... | 94.4 | 92.3 | + 2.1 |
| 1953 | I ... ... | 98.9 | 93.9 | + 5.0 |
| | II ... ... | 100.6 | 94.8 | + 5.8 |
| | III ... ... | 99.9 | 98.3 | + 1.6 |
| | IV ... ... | 94.5 | 99.2 | — 4.7 |
| 1954 | I ... ... | 92.7[4] | 96.6[4] | — 3.9[4] |

Source : U.S. Department of Commerce, *Survey of Current Business* and the Federal Reserve Bulletin.

[1] Calculated from seasonally adjusted quarterly totals at annual rates, with the exception of the figures for Government unilateral payments to foreigners which are not seasonally adjusted.

[2] Tax revenues net of the item ' subsidies less current surplus of government enterprises ' in the Federal Reserve Bulletin.

[3] Total Government expenditures on goods and services less unilateral transfers to foreign countries, plus transfer payments and net interest paid by the government.

[4] Calculated from preliminary and estimated figures.

a potent built-in stabiliser. Since Government purchases of goods and services were 13 per cent of the G.N.P. in 1948 and 28 per cent of a larger G.N.P. in 1953, the built-in stabilisers have probably had greater effect this time than in 1949.

It is also interesting to note a more active use of monetary weapons during the current recession. In both recessions open market operations were used to ease the credit position, but during the current recession commercial banks' reserve requirements were lowered and the Bank rate weapon was used.[1]

Differences in *price movements* prior to and during the two recessions may have influenced consumers' as well as business behaviour. Wholesale prices fell by 6 per cent during the 1949 recession, but they have been remarkably stable during the current recession. Prior to 1949 wholesale prices had been rising steadily, whereas this time they had been falling steadily since 1951. The abrupt changeover from rising prices and inventory profits to falling prices and inventory losses, which took place in 1949 did not, therefore, recur in 1953. In the earlier recession, consumer prices fell by 6½ per cent between August 1949 and February 1950, but this time they have fallen only 1 per cent so far, and they did not start falling until the last quarter of 1953. Food and Clothing prices had been falling for some time, but Rent, Transport and Medical Care rose steeply ; rent because of the lifting of rent control and transport because the rising costs during the Korean boom were only now being passed on to the consumer.

## The External Impact of the Recessions

After describing the effect of the two recessions on U.S. imports we shall go on to consider why the effect on the balance of payments of other countries was much less severe in 1953–4 than in 1948–9. (See Chart I, p. 247.)

Chart I shows the value of merchandise imports from all areas, from the Sterling area as a whole and from the U.K. We have excluded military expenditures in foreign countries[2] as these are not directly affected by recessions. It is obvious from the chart that the 1948–9 fall in imports was much more marked than the fall up to the first quarter of 1954. Measuring from the peaks prior to each recession as shown in Chart I, the reduction in total merchandise imports at the lowest point in each recession was 21 per cent in 1948–9 as against 13 per cent this time. But between the first and third quarters of 1948 average U.S. import prices fell by almost 10 per cent while this time they have been more or less stable.[3] These price changes account for most of the difference between the changes in the value of total merchandise

[1] During 1948 the Federal Reserve Bank Discount Rate in New York was raised by successive stages from 1.22 per cent to 1.50 per cent and no attempt was made to reduce it again during 1949. This time the discount rate was raised from 1¾ per cent to 2 per cent in January, 1953. It was lowered first to 1¾ per cent in January, 1954, and then to 1½ per cent in April.

[2] See footnote 2 to Table 6.

[3] A more detailed discussion of some of the factors affecting world raw material prices in the latest recession appears in the following article.

imports in the two recessions: in both recessions the fall in the *volume* of imports was similar. It was the combination of falling volume and falling prices in the 1948–9 recession which caused the more serious decline in the flow of dollar payments for imports.

The value of imports from the Sterling Area in 1948–9 fell by 38 per cent and those from the U.K. by 36 per cent: and in 1953–4 both have fallen by 23 per cent. In both recessions the fall in merchandise imports from the Sterling Area was very much greater than the fall in merchandise imports. from all areas. As the Area's exports to the American market are predominautly raw materials, they are inevitably harder hit by a recession concentrated mainly in business inventories.

We have so far ignored U.S. military expenditures abroad. But it is of considerable importance that these expenditures, which are not directly affected by a recession, now bulk so large as a source of dollars.

TABLE 5

*U.S. Imports of merchandise and military expenditure abroad* (*$ millions*)

| | | *All areas* | | | *Sterling Area* | | | *United Kingdom* | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Merchandise* | *Military* | *Total* | *Merchandise* | *Military* | *Total* | *Merchandise* | *Military* | *Total* |
| 1948 | IV ... | 1,944 | 194 | 2,138 | 324 | 27 | 351 | 85 | 17 | 102 |
| 1949 | I ... | 1,875 | 179 | 2,054 | 364 | 21 | 385 | 102 | 13 | 115 |
| | II ... | 1,675 | 176 | 1,851 | 283 | 17 | 300 | 64 | 8 | 72 |
| | III ... | 1,536 | 133 | 1,669 | 224 | 16 | 240 | 65 | 7 | 72 |
| | IV ... | 1,793 | 133 | 1,926 | 290 | 24 | 314 | 63 | 14 | 77 |
| 1953 | I ... | 2,797 | 564 | 3,361 | 446 | 61 | 507 | 133 | 42 | 175 |
| | II ... | 2,882 | 600 | 3,482 | 461 | 77 | 538 | 137 | 56 | 193 |
| | III ... | 2,679 | 653 | 3,332 | 403 | 68 | 471 | 146 | 47 | 193 |
| | IV ... | 2,596 | 679 | 3,275 | 391 | 72 | 463 | 128 | 53 | 181 |
| 1954 | I ... | 2,512 | 618 | 3,130 | 358 | 89 | 447 | 112 | 68 | 180 |

*Source:* U.S. Department of Commerce: *Survey of Current Business.*

In Table 5 military expenditures in foreign countries are added to merchandise payments. As military expenditures were small and falling in the 1948–9 recession, the percentage falls in the totals was similar to the percentage falls in merchandise imports. But in the 1953–4 recession, the picture is very different. Military expenditures were large and rising: the fall in imports from all areas, *including* military expenditures, was 10 per cent against a 13 per cent fall if military expenditures are excluded. Similarly, the fall in the total imports from the Sterling Area was 17 per cent, compared with a fall in imports (excluding military expenditures) of 23 per cent. And the U.K. was even more favoured: the fall in U.S. imports (including military expenditures) was as little as 7 per cent; but when military expenditures are excluded the fall was 23 per cent.

Thus the smaller reduction in the payments for merchandise imports, and the greatly increased military expenditures, are part of the explanation of the comparatively slight effect of the latest recession on the balance of payments of other countries. In addition, it can be argued that the changes in U.S. balance of payments *between* the two recessions were such that even if the fall in total imports had been as great as in 1948–9, the consequences for other countries would not have been so severe.

The changes between 1948 and 1953 show up quite clearly in Table 6. The balance on goods and services (excluding unilateral military transfers), of the U.S. with the rest of the world as shown in line 7, has swung from a huge surplus in the years 1947–9 to a balance in 1953. The overall balance (here defined as the balance on current and capital transactions which was financed either by non-military aid or by a flow of gold and dollar assets) in line 10, has also deteriorated markedly, and there was actually a small deficit in 1953. The consequences of this deterioration (which represents, of course, an improvement in the rest of the world's payments position with the U.S.) can be seen in lines 11 and 12, which show how the overall surplus or deficit was financed. Line 11 shows non-military aid, which was very high in 1947

TABLE 6

*United States Balance of Payments 1947–53*
*$ billions*

| | | *1947* | *1948* | *1949* | *1950* | *1951* | *1952* | *1953*[1] |
|---|---|---|---|---|---|---|---|---|
| Export of goods and services : | | | | | | | | |
| Total ... ... ... ... | (1) | 19.8 | 17.0 | 16.0 | 14.4 | 20.2 | 20.6 | 21.4 |
| *Less* Unilateral military transfers[2]... | (2) | 0.1 | 0.4 | 0.2 | 0.6 | 1.5 | 2.6 | 4.7 |
| *Net Total* ... ... ... | (3) | 19.7 | 16.6 | 15.8 | 13.8 | 18.7 | 18.1 | 16.8 |
| Imports of goods and services : | | | | | | | | |
| Military expenditures ... ... | (4) | 0.5 | 0.8 | 0.6 | 0.6 | 1.3 | 1.9 | 2.5 |
| Other ... ... ... ... ... | (5) | 7.8 | 9.5 | 9.0 | 11.5 | 13.8 | 13.9 | 14.3 |
| *Total* ... ... ... ... | (6) | 8.3 | 10.3 | 9.6 | 12.1 | 15.1 | 15.8 | 16.8 |
| Balance on goods and services (net outflow (—)) ... ... ... | (7) | +11.4 | +6.3 | +6.2 | +1.7 | +3.6 | +2.3 | —[3] |
| United States private capital (net outflow (—)) ... ... ... | (8) | —1.0 | —0.9 | —0.6 | —1.3 | —1.1 | —1.1 | —0.1 |
| Other unilateral non-Govt. transfers +errors and omissions (net outflow (—)) ... ... ... ... ... | (9) | +0.3 | +0.3 | +0.2 | —0.4 | —[3] | —[3] | —0.4 |
| Overall Balance (net outflow (—)) ... | (10) | +10.7 | +5.8 | +5.7 | —[3] | +2.7 | +1.2 | —0.5 |
| The financing of the overall balance : | | | | | | | | |
| U.S. Govt. credits and grants (excluding military transfers) ... ... | (11) | —8.8[4] | —4.6 | —5.6 | —3.6 | —3.1 | —2.4 | —2.0 |
| Increase (+) or decrease (—) in foreign gold and dollar assets through transactions with the U.S. ... ... | (12) | —1.9 | —1.2 | —0.1 | +3.6 | +0.4 | +1.2 | +2.5 |

[1] January–September data at annual rates.

[2] 'Unilateral military transfers' which appear on the export side of table 6 (line 2) consist of military end items (mainly tanks, guns, ammunition and aircraft) which were transferred directly to foreign countries and for which no external payments arose. Because of this they are excluded from the balances in tables 6 and 7. 'Military expenditures' which appear on the import side of table 6 (line 4) consist of purchases in foreign countries by U.S. forces and military agencies both for use abroad and for import into the U.S.A. They also include the spending of U.S. troops in foreign countries and 40 per cent of the total cost of basic military installations under N.A.T.O. paid for by the U.S.A. These are included in total imports because they do give rise to external payments, and are a source of dollars to foreign countries.

[3] Less than $50 million.

[4] Includes $3.1 billion for subscription to International Monetary Fund and International Bank for Reconstruction and Development.

*Source* : Economic Report of the President, January, 1954.

and apart from 1949 has been falling ever since. Yet despite the very high levels of aid in the early years of the period the overall surplus was so high that there was a net outflow of foreign gold and dollar reserves into the U.S. in each year up to 1950. In 1950–53. the deterioration in the overall balance was so great that despite the steadily falling level of aid foreign countries were able to increase their gold and dollar reserves (as a result of transactions with the U.S.) in each of these years.

Table 7 gives similar data for the Sterling Area, and continental Western Europe and dependencies.[1] In both cases the overall U.S. balance has deteriorated significantly over the period, and aid has decreased. The marked improvement in the trading position of these areas is reflected in the movement of the gold and dollar reserves. It should be noted, however, that given the declining level of non-military aid, the improvement in the Sterling Area's position was not sufficiently great to prevent an outflow of dollar reserves in transactions with the U.S. each year except 1950 and 1953. The continental Western European area, largely because of a higher level of non-military aid, increased its dollar reserves in transactions with the U.S. every year after 1948.

TABLE 7

*U.S. Balance of Payments with the Sterling Area and Continental Western Europe, 1948–53*

(*$ billions*)

| | *Equivalen line in Table 6* | *1948* | *1949* | *1950* | *1951* | *1952* | *1953*[1] |
|---|---|---|---|---|---|---|---|
| *With the Sterling Area*[2] | | | | | | | |
| Overall Balance ... ... | (10) | +2.0 | +1.6 | —0.3 | +0.7 | +0.8 | —0.5 |
| The financing of the overall balance : | | | | | | | |
| U.S. Govt.Non- Military credits and grants ... | (11) | —0.9 | —1.1 | —0.7 | —0.3 | —0.6 | —0.5 |
| Increase (+) or decrease (—) in foreign gold and dollar assets[3] ... ... | (12) | —1.0 | —0.4 | +1.0 | —0.4 | —0.2 | +0.9 |
| *With Continental W. Europe and Dependencies*[2] | | | | | | | |
| Overall Balance ... ... | (10) | +3.0 | +3.2 | +1.2 | +1.5 | +0.4 | —0.5 |
| The financing of the overall balance : | | | | | | | |
| U.S. Govt. Non-military credits and grants ... | (11) | —2.8 | —3.4 | —2.2 | —1.8 | —1.1 | —0.8 |
| Increase (+) or decrease (—) in foreign gold and dollar assets[3] ... ... | (12) | —0.2 | +0.2 | +0.9 | +0.3 | +0.7 | +1.2 |

[1] January–September data at annual rates.
[2] For geographic coverage, see Survey of Current Business, December 1952.
[3] Includes gold transactions with the U.S. only.
*Source* : Economic Report of the President, January, 1954.

Part of the deterioration in the U.S. balance of payments can be accounted for by price changes.

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[1] Comparable 1947 figures are not available.

TABLE 8

*Indices of unit value of U.S. trade*

| | *1947* | *1948* | *1949* | *1950* | *1951* | *1952* | *1953* |
|---|---|---|---|---|---|---|---|
| Imports ... ... ... | 91 | 100 | 95 | 103 | 130 | 123 | 117 |
| Exports ... ... ... | 94 | 100 | 93 | 90 | 103 | 102 | 102 |

The movement of the terms of trade against the U.S., which began in 1950, can in large measure be attributed to the rise in raw material prices following the war in Korea and the U.S. stockpiling policies. Although average import prices have fallen considerably since 1951, they were still some 17 per cent above the 1948 level in 1953, while export prices were only 2 per cent higher. As the value of exports of goods and services (excluding unilateral military transfers) was roughly the same in 1953 as in 1948, there can have been no great change in the volume of exports between these years. There must have been, however, a marked increase in the volume of imports between 1948 and 1953 : import prices were 17 per cent higher, but the value of imports was no less than 60 per cent higher. The value of imports (line 6, table 6), apart from a fall in the 1949 recession, have risen in each year after 1947. The value of exports (line 3) have fluctuated considerably, but there has certainly been no consistent increase.

The major reason, then, why a U.S. recession in 1953 was not nearly so serious for the balance of payments of other countries as was that of 1948–9, is that in 1948 their payment situation with the U.S. was so critical that the fall in exports to the States was enough to provoke a crisis. The fact that the fall in exports to the U.S. in the 1949 recession was considerably larger than the fall in 1953 is relatively unimportant. By 1953 their payments situation had improved so much that even an equivalent fall in U.S. imports would not have had similar drastic consequences on dollar reserves. It is not, however, possible to say that the world in 1953 has reached a permanently stable position in its trade with the U.S., nor that the constantly recurring dollar crises are over. It is clear that the rest of the world is still heavily dependent on 'exceptional' flows of dollars from the U.S., whether they be in the form of military expenditures, or in the form of non-military credits and grants. In addition, there has been a great increase in the ' export ' of military goods which are supplied by the U.S. to other countries without dollar payment. If, for any reason, these aids were to be curtailed, the consequences on the balance of payments position of the rest of the world with the U.S. would be extremely serious.

COLIN BRUCE.

E. B. GIBB.

# THE RECENT UNITED STATES RECESSION AND THE STRENGTH OF PRIMARY PRODUCT PRICES[1]

## I. The Nature of the Problem

Much interest has been aroused recently by the apparently paradoxical strength of primary product prices during the United States recession. At the time of writing, of course, the recession has been neither very deep nor very prolonged. Nevertheless, it had been generally taken for granted that a slight recession in the U.S. would cause severe repercussions in the rest of the world, and it was fashionable to quote, in this connection, the mild recession in the U.S. in 1949. The fact that primary product prices have, on the whole, been rising during the latest recession has given rise to the presumption that the effects of this U.S. recession have been offset by the more or less simultaneous rise in the level of economic activity in Europe. The object of this paper is to investigate this view. In doing so, however, it will be found necessary to consider certain other factors which may have been important.

## II. Basic Data

First, what are the key facts about (1) the U.S. recession, (2) the rise in European activity, and (3) the strength of primary product prices ?

### (*a*) *The U.S. recession*[2]

Since about mid-1953 the major economic indicators in the U.S. have been declining. Total industrial production began to decline from July 1953, and during the following nine months fell by about 10 per cent. Gross private domestic investment has fallen by about 20 per cent since the second quarter of 1953, unemployment has risen above the normal seasonal level, and business inventories have been declining since the last few months of 1953. In the agricultural sector of the economy, on the other hand—of vital importance in the U.S.—farm incomes (which form about 8 per cent of U.S. gross national product) experienced their usual seasonal increase up to October 1953, and the usual seasonal decline has set in since then. As a result of these various movements, G.N.P. has fallen by about 4 per cent between the second quarter of 1953 and the first quarter of 1954. During the last month or so, however, there are some signs that a revival may soon take place.

### (*b*) *The European revival*

In Western Europe, the picture is very different. After a prolonged period of stagnation in industrial production a revival began in the middle of 1953 and by the fourth quarter of 1953 industrial production was about 8 per cent above the corresponding quarter of 1952. All major sectors seemed to have shared in the revival but to varying extents. The greatest increases have taken place in consumer goods industries and in the chemical industries.

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[1] I am indebted to Mr. H. Lohmann for valuable assistance with the compilation of data.

[2] All the data given in the following paragraph are seasonally adjusted. Sources : mainly '*Economic Indicators*' and '*Federal Reserve Bulletin*'.

Agricultural output in 1953–54 has also been much higher than in the previous year. Building has continued to increase in most countries, exports have been increasing, and defence expenditures have also increased though at a reduced rate. Taking all these and other factors into consideration, it is reasonably certain that the combined G.N.P. of Western Europe (which is probably about half that of the U.S.) has increased by a significant amount since mid-1953.

### (c) *Primary product prices*

A more detailed analysis of the prices of various primary products will be given below. At this stage, it suffices to say that ' sensitive ' world commodity prices[1] have been rising more or less steadily since August 1953 and by April 1954 had reached a point about 10 per cent higher than in August 1953 ; Moody's index (relating to U.S. markets) shows a somewhat greater rise and Reuter's (relating to British markets) a somewhat smaller rise. But there are considerable differences between individual products. Prices of beverages, particularly cocoa and coffee, have shown considerable increases; the prices of other products (rubber, wheat, sugar, copper, hides and skins) have fallen by significant amounts; and textile fibres and most metals have been just about holding their own. Nevertheless, whichever of the usual aggregate indices is chosen, the general trend during the last nine months is upward.

## III. U.S. and Western European Imports

If, for the sake of simplicity and brevity, one considers the imports of the U.S. and Western Europe from all other countries of the world combined, excluding Canada and Eastern Europe (referred to henceforth as ' rest of world '), one has a fairly good approximation to their imports from primary producing areas.

At current prices, United States imports from the rest of the world certainly declined in the second half of 1953 below the level of the corresponding period of 1952, but the decline was only pronounced in the last quarter of 1953. In the first quarter of 1954 the value of U.S. imports from the rest of the world recovered somewhat but was still well below the level of the first quarter 1953. Europe's imports from the rest of the world, on the other hand, have increased steadily since mid-1953 and were higher in each quarter than in the corresponding quarters of a year earlier. Taking the whole three quarters mid-1953 to March 1954 the value of U.S. imports from the rest of the world was $330 million lower, and the value of European imports was $350 million highert, han in the corresponding nine month period of 1952–53.

An analysis in ' real ' terms can only be made with considerable reserve for the price deflators which have to be used are those relating to the imports of the U.S. and of Western Europe from *all* other countries. Nevertheless, for what it is worth, such an analysis shows that at constant (1950) prices the direction of the above changes in the current values of imports from the rest of the world are not altered by the conversion to ' volumes ', the main change being to reduce the magnitude of the fall in U.S. imports in the whole nine month period relative to the rise in European imports (see Annex Table A). In fact, the ' volume ' of Europe's imports from the rest of the world in this nine month period appears to be some 12 per cent higher than in the corresponding period of 1952–53. An important point to be borne in mind is that Western Europe is twice as important as the U.S. as a market for primary producing countries taken as a whole. Consequently, the volume of exports of the rest of the world to the U.S. and Western Europe combined has been rising during the last nine months or so and, during this period, has been much higher than the corresponding period in 1952–53.

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[1] *Financial Times* Index of Sensitive World Commodity Prices.

TABLE I

*Approximate Changes in U.S. and Western European Imports from Rest of World[1] at Constant (1950) Prices[2]*

*Change in $ million over corresponding quarters of 1952–53 ; $ million, quarterly totals*

| | *3rd Qtr. 1953* | *4th Qtr. 1953* | *1st Qtr. 1954* |
|---|---|---|---|
| United States ... ... | + 30 | —180 | —110 |
| O.E.E.C. Countries ... | +370 | +330 | +240 |
| Total ... ... ... | +400 | +150 | +130 |

[1] Excludes each other, Canada and Eastern Europe.

[2] Current values deflated by average value of U.S. imports from all sources and average value of O.E.E.C. countries combined imports from all non-member countries.

*Source.* O.E.E.C. Statistical Bulletins, Foreign Trade, Series I.

Table II provides a rough overall picture of the situation for the main products. Of the eleven products shown nine of them are products of which the United States is a significant importer. With the sole exception of coffee and tea, U.S. imports of all these nine products have declined since the second quarter of 1952.

During the same period of time, Western Europe's imports of eight of the eleven products listed have increased. But the two products which are the exceptions for U.S. imports (i.e. U.S. imports rose) do not coincide at all with the three that are the exceptions for the European imports (i.e. the European imports fell). Thus, five products (Class II) show the U.S. imports and European imports moving in the same direction. Consequently, only four products are left (Class I) for which European imports rose while U.S. imports fell. And for these four products, prices fell in two cases, even though the rise in European imports had more than offset the fall in U.S. imports. In short, it is not possible, at least as far as the products examined are concerned, to establish, on a product by product basis, that a rise in European imports offsetting a fall in U.S. imports has been responsible for a rise in prices.

TABLE II

*Synoptic Table of Selected Developments in Individual Primary Products*[1]

| Class | Product | *U.S. Imports* | *Combined European Imports* | *Combined Imports* | *Price* |
|---|---|---|---|---|---|
| I | Crude Rubber ... ... | F | R | r | f |
| | Crude Oil ... ... ... | f | r | r | f |
| | Copper ... ... ... | F | R | F | unchanged |
| | Tin ... ... ... ... | f | R | r | r |
| II | Sugar ... ... ... | f | f | f | f |
| | Coffee ... ... ... | r | r | r | R |
| | Cocoa ... ... ... | F | f | F | R |
| | Tea ... ... ... ... | r | R | R | R |
| | Raw Wool ... ... ... | F | f | F | f |
| III | Raw Cotton ... ... | ...[2] | r | r[2] | r |
| | Raw Jute ... ... ... | ...[2] | R | r[2] | r |

*Note.* F and R mean ' fell ' and ' rose ' respectively. Capital letters indicate ' much ' and small letters indicate ' little '.

[1] The definition of ' rose ', ' fell ', etc., depends firstly on the time period envisaged. For the above table, the reference period is the 2nd quarter of 1952, and an item is considered to have ' fallen ' if the figures in the following three quarters show a more or less steady decline since that period or if any upturn in any one of the three quarters failed to bring that item above the level of the reference period. No correction is made for seasonal variation since it cannot be established that a seasonal fall in say, quantities imported, has no effect on prices.

[2] The U.S. is a major net *exporter* of cotton, and is important in the jute market only as a major importer of jute *manufactures*.

*Sources.* For sources, and data relating to U.S. and Western European imports, see Annex, Table B.

On the other hand, the presumption that the rise in Western European imports contributed to the general maintenance of primary product prices, is far from discredited by the above table. First, as pointed out already, Western Europe's imports of eight of the eleven products did rise. Secondly, European imports of the two products, cotton and raw jute (Class III) also rose, and though the U.S. is not a prominent importer of either of these commodities, they are still relevant to any appreciation of the *general* strength of primary product prices. Finally, insofar as discussion is concerned with aggregate indices of primary product prices, the *degree* to which individual prices rose or fell is just as important as any other feature of the price changes. Thus, ideally, one should make allowance, for example, for the beneficial influence of the rise in European imports on the price of those products whose prices fell but by smaller amounts than if European imports had also fallen. Nevertheless, it is clear that the offsetting increase in European imports cannot provide a complete explanation of the markets of primary commodities. It is necessary to consider certain other factors at work in these markets.

## IV. OTHER FACTORS

### (*a*) *U.S. price supports, and stockpiling operations*

The existence of price supports in the U.S. for a wide range of products has been a stabilising influence, as the chief result of a fall in overall demand has been an increase in U.S. government stocks of the products concerned.

There can be little doubt that if the U.S. government did not carry out such a policy and had not exercised such restraint and caution in investigating means for disposing of excess stocks, prices of many products would have been much weaker. The most important examples of the influence of U.S. price supports are grains, wool, cotton and certain dairy products. The price of wheat has been influenced, of course, by the International Wheat Agreement, but there is little doubt that if the U.S. government were not prepared to hold enormous stocks of surplus wheat, its price would be much lower than at present. With rice, the situation is even more complicated for not only does the U.S., which is a net exporter, support the price of domestically produced rice, but trade in rice between Far Eastern countries is subject to many government to government agreements—often on a more or less barter basis. Nevertheless, there has recently been a considerable easing in the price of rice, due partly to increased output and partly to the fact that a part of the world surplus of wheat has been finding its way into certain Far Eastern countries where it constitutes a substitute for rice.

The effect of U.S. price support operations on textiles is equally important. The U.S. is, of course, a predominant exporter of cotton. The U.S. imports only a relatively small amount of longer staple Egyptian cotton. U.S. cotton exports are now sold at the U.S. support price so that the main effect of a fall in U.S. internal demand is simply to increase the amount of government-held stocks. Most of the rest of the world's cotton exports are usually sold at a price which bears a roughly constant relationship with the U.S. price so the prices of the rest of the world's cotton exports have also been kept more or less stable, though the recent revival in European and Japanese imports has, of course, contributed to this result. With wool, of which the U.S. is both a major producer and importer, the U.S. domestic wool price has remained fairly steady at about the support level, however, and the effect of the continued fall in U.S. consumption of wool has mainly been to increase the quantities of domestic wool which the U.S. government has acquired in the course of its support operations. But even prices of non-U.S. wool have remained firm. The fall in the U.K. price of wool is no doubt partly due to declining freight rates.

In a slightly different category is the U.S. stockpiling policy. By the middle of 1953 the markets were already beginning to discount the approaching termination of U.S. purchases for strategic stockpiling. But later special U.S. purchases of certain products (tin and copper) plus the announcement in March 1954 of new stockpiling authorisations helped to bolster up many markets, particularly the metals.

### (*b*) *The supply position*

The strength of certain prices is also partly due to reductions in supply. These have been most pronounced for coffee, cocoa, and tea, which have shown the most marked increases in prices. Brazil's coffee output had been reduced by frost in 1953, and there was a fall in cocoa production in West

Africa. In India, unfavourable weather and restricted pluckings had caused a fall in tea output. Other important reductions in output have taken place in raw jute and, towards the end of 1953, in U.S. copper, lead and zinc. The decline in raw jute output in Pakistan is a direct reaction to a preceding (1952) fall in price. The government of Pakistan was obliged to enforce acreage restriction in order to cut the financial burden of its price support system. Anyway, as far as jute is concerned, demand is more sensitive to variations in agricultural output rather than industrial output, and agricultural output in Europe rose considerably in 1953.

Conversely, the weakness of certain products seems to have been due more to increased output than to a fall in demand. This is particularly apparent with the foodstuffs such as grains, rice, butter and cheese. The weakness of these products, which is reflected in the accumulation of stocks in the U.S. and elsewhere, has not been due to any shifts in demand, since demand for food products has not apparently been affected at all by the U.S. recession.

### (*c*) *Changes in demand*

For some products, demand seems to have increased in response to preceding falls in price. One well-known case is rubber, the price of which seems to have been steadied, after a prolonged decline, at a level slightly below that of synthetic rubber. Similarly, the demand for jute appears to have been stimulated not only by the overall increase in demand for products such as bags for agricultural use but also by the improved competitive position of jute against substitutes such as paper in the production of such products. Further, the revival in demand in Europe, particularly for textiles, was probably aided by the impression that the fall in prices of most raw materials which had been continuing for over a year could hardly continue much longer.

### (*d*) *The level of stocks*

The position of various industrial raw materials, including textiles, had also to some extent been strengthened by the low levels of stocks in many important consuming countries. This was largely the aftermath of the slump in primary products prices which began early in 1953 with the prospects of a Korean armistice. By the middle of the year, there was consequently little room for further speculative reduction in stocks following the conclusion of the armistice or the growing prospects of a slackening in U.S. activity. The low level of stocks of several products provided a basis for a rapid strengthening of prices once other factors, such as the European revival, came on to the scene.

## V. CONCLUSIONS

This review suggests that the general strength of primary product prices throughtout the period of the recent U.S. recession has been due to various factors. Chief among these has been the revival in Western Europe's economic activity and imports from primary producing areas at the same time as the U.S. has been suffering from a recession.

But other factors have also played a part, such as—

(i) a reduction in supply of certain products ;
(ii) an increased demand for certain products in response to earlier declines in prices ; and
(iii) the low level of stocks of some products in 1953.

Each of these three factors can be partly attributed to the earlier collapse of the post-Korean boom. First, the heavy fall in prices was certainly largely responsible for the heavy reduction in jute output and for checking the output of the metals and of tea. Secondly, the increased demand for certain products, such as jute, and the recent strengthening in demand for wool and cotton is also probably a reaction, to some extent, to the earlier decline in prices. Thirdly, the low level of stocks of many products in 1953 may also be partly due to the decline in prices in the preceding year, causing stocks to be run down until it was felt that prices had more or less reached a floor.

Furthermore, the most interesting aspect of the situation, namely, the revival in European activity, is probably also partly due, to the post-Korean fall in primary product prices. For the result of the fall since 1951 in primary product prices has been a substantial improvement in Europe's terms of trade. From the second quarter of 1952 to the second quarter of 1954, Western Europe's terms of trade improved by no less than 23 per cent, which cannot have failed to have an impact on the real income of consumers in the main raw material importing countries of the world. It is also possible that consumers' demand has been further stimulated by one of those shifts in the propensity to consume following a period of significant price changes which have characterised consumers' behaviour in post-war years. It is particularly important, in this connection, to bear in mind the fact that the revival in European activity in 1953 has been particularly marked in the consumption industries, notably textiles.

Certain U.S. policies have also helped to modify the effects of the recession. First, the prices of several commodities have been strengthened by U.S. government price support action, and the recent recognition of the need to avoid harmful effects on world markets in the management of strategic stockpile policies and in the disposal of surplus stocks of agricultural produce. Secondly, the rise in European activity and imports has been facilitated by the continued strengthening of Western Europe's dollar balance and gold and dollar reserves, aided by an increased flow of exceptional dollar resources to Western Europe (as to the rest of the world) in the form of military aid, offshore purchases and local troop conversions. Thus, the non-dollar world in general, and Western Europe in particular, has not been obliged to put the brake on internal expenditure at the first sign of a recession in the U.S. On the contrary, the easing of the payments situation has enabled many European governments to take deliberate measures. such as tax reductions, to permit an expansion of consumers' incomes. There is nothing in this feature of recent developments, however, to suggest that it is likely to become the normal sequence of events, whenever there is a recession in the U.S. !

Insofar as the preceding fall in primary product prices has aided, in various ways, the present strength in primary product markets, the moral of the story from a purely *theoretical* point of view is the importance of price changes and, above all, the timing of these price changes in cyclical fluctuations. Consumers tend to be rather cold-shouldered in trade cycle theory. True, their propensity to consume is allowed to vary—but almost entirely in response to income changes which are, in turn, largely determined by investment. The possibility of important changes in the level of consumption, such as those which have characterised the whole post-Korean period, in response to price changes which have affected both real income and possibly also the propensity to consume, is usually neglected. Presumably, the difficulty is one of incorporating, in a satisfactory manner, changes in terms of trade in neat trade cycle models.[1]

From a *practical* point of view, the moral of the story seems to be that if the U.S. recession had come at a later date, the impact might have been much more severe, for many of the factors responsible for the strength of primary prices seem to be related to the preceding fall in prices following the end of the Korean boom. One of these factors, namely, the stimulation of European demand through improved terms of trade and a possible increase in the propensity to consume, has been further assisted by the flow of exceptional dollar resources to Europe. Thus, the fact that the recent recession has not had severe repercussions on primary product markets cannot be taken as a sign that the customary assumption concerning the sensitivity of the rest of the world to a change in the level of U.S. activity should be discarded now on account of the recent events. It would indeed be rash to assume that there will be a boom in Europe every time there is a recession in the U.S.

*Paris* W. BECKERMAN.

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[1] See my article ' A Note on Variable Prices and Foreign Trade Multipliers ', *Review of Economic Studies*, Vol. XXI (2) No. 55, p. 163, footnote 2.

## ANNEX

*Table A—U.S. and O.E.E.C. Countries Imports from Rest of World*[1]

*$ billion ; Quarterly totals*

| | *1952* | | | | *1953* | | | | *1954* |
|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2* | *3* | *4* | *1* | *2* | *3* | *4* | *1* |
| I. *Current Prices* : | | | | | | | | | |
| U.S.A. | 1.77 | 1.59 | 1.50 | 1.61 | 1.66 | 1.62 | 1.49 | 1.39 | 1.56 |
| Western Europe | 3.59 | 3.32 | 2.89 | 3.07 | 3.25 | 3.40 | 3.05 | 3.21 | 3.30 |
| Total | 5.36 | 4.91 | 4.39 | 4.68 | 4.91 | 5.02 | 4.54 | 4.60 | 4.86 |
| II. *Constant (1950) Prices*[2] | | | | | | | | | |
| U.S.A. | 1.43 | 1.33 | 1.28 | 1.40 | 1.46 | 1.43 | 1.31 | 1.22 | 1.35 |
| Western Europe | 2.74 | 2.59 | 2.39 | 2.64 | 2.79 | 3.03 | 2.76 | 2.98 | 3.03 |
| Total | 4.17 | 3.92 | 3.67 | 4.04 | 4.25 | 4.46 | 4.07 | 4.20 | 4.38 |

[1] Excludes each other, Canada and Eastern Europe.

[2] Current values deflated by average value of U.S. imports and average value of Member Countries combined extra-European imports.

*Source:* O.E.E.C. Statistical Bulletins, Foreign Trade, Series I.

*Table B. Imports of Selected Primary Products into the U.S. and Seven O.E.E.C. Countries*[1] *'000 metric tons*

| *Product* | *Imported by* | *1951* (Qrt'ly Av.) | *1952* | | | | *1953* | | | | *1954*[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *1* | *2* | *3* | *4* | *1* | *2* | *3* | *4* | *1* |
| **Sugar** | U.S. ... ... | 750.0 | 837.6 | 1035.6 | 915.6 | 364.5 | 809.4 | 963.0 | 899.4 | 434.4 | 858 |
| | O.E.E.C. ... | 1085.2 | 878.3 | 1284.5 | 818.4 | 696.2 | 682.9 | 1439.8 | 1462.4 | 1028.8 | 1025 |
| | Total ... ... | 1835.2 | 1715.9 | 2320.1 | 1734.0 | 1060.7 | 1492.3 | 2402.8 | 2361.8 | 1463.2 | 1883 |
| **Coffee** | U.S. ... ... | 306.1 | 378.3 | 243.6 | 283.8 | 312.9 | 554.3 | 281.1 | 294.3 | 336.0 | 368 |
| | O.E.E.C. ... | 100.6 | 124.0 | 103.4 | 102.8 | 111.6 | 125.4 | 117.1 | 102.4 | 131.9 | (140) |
| | Total ... ... | 406.7 | 502.3 | 347.0 | 386.6 | 424.5 | 479.7 | 398.2 | 396.7 | 467.9 | (508) |
| **Cocoa** | U.S. ... ... | 69.4 | 91.5 | 82.8 | 31.2 | 55.5 | 80.1 | 83.4 | 45.9 | 47.7 | (82) |
| | O.E.E.C. ... | 82.4 | 103.9 | 87.2 | 43.4 | 71.5 | 119.0 | 102.4 | 61.5 | 85.4 | 121 |
| | Total ... ... | 151.8 | 195.4 | 170.0 | 74.6 | 127.0 | 199.1 | 185.8 | 107.4 | 133.1 | 203 |
| **Tea** | U.S. ... ... | 9.8 | 11.1 | 10.2 | 11.7 | 9.0 | 13.2 | 12.9 | 11.7 | 11.4 | (32) |
| | O.E.E.C. ... | 55.9 | 77.1 | 41.7 | 54.5 | 65.7 | 57.2 | 48.4 | 56.0 | 78.0 | 90 |
| | Total ... ... | 65.7 | 88.2 | 51.9 | 66.2 | 74.7 | 70.4 | 61.3 | 67.7 | 89.4 | 122 |
| **Crude Rubber** | U.S. ... ... | 186.6 | 248.7 | 212.7 | 171.9 | 186.0 | 171.9 | 181.2 | 159.9 | 144.6 | (140) |
| | O.E.E.C. ... | ... | 196.8 | 168.3 | 171.2 | 178.6 | 183.8 | 156.9 | 160.9 | 173.9 | 188 |
| | Total ... ... | | 445.5 | 381.0 | 343.1 | 364.6 | 355.7 | 338.1 | 320.8 | 318.5 | 328 |
| **Raw Wool** | U.S. ... ... | 41.8 | 38.1 | 40.8 | 39.0 | 52.2 | 45.9 | 36.3 | 33.0 | 22.8 | (22) |
| | O.E.E.C. ... | (137.2) | 178.3 | 196.3 | 157.8 | 179.4 | 269.4 | 264.1 | 189.7 | 164.9 | 201 |
| | Total ... ... | 179.0 | 216.4 | 237.1 | 196.8 | 231.6 | 315.3 | 300.4 | 222.7 | 187.7 | 223 |
| **Raw Cotton** | O.E.E.C. ... | 321.5 | 453.5 | 289.0 | 257.6 | 309.4 | 374.0 | 343.8 | 308.2 | 326.8 | 387 |
| **Jute** | O.E.E.C. ... | (100) | 133.0 | 78.3 | 37.2 | 107.9 | 165.5 | 118.5 | 104.2 | 124.3 | 144 |
| **Crude Oil** (cubic metres) | U.S. ... | 7263 | 7316 | 8221 | 8833 | 9124 | 8845 | 9716 | 9637 | 9104 | (9150) |
| | O.E.E.C. ... | 14147 | 17374 | 17900 | 18024 | 18930 | 18566 | 20200 | 20570 | 19598 | 20958 |
| | Total ... ... | 21410 | 24690 | 26121 | 26857 | 28054 | 27411 | 29916 | 30207 | 28702 | 30108 |
| **Copper** | U.S. ... ... | 122.3 | 126.9 | 102.9 | 177.3 | 171.6 | 149.7 | 199.2 | 156.9 | 105.0 | (121) |
| | O.E.E.C. ... | (206.4) | 246.9 | 260.3 | 239.7 | 256.8 | 229.3 | 192.6 | 204.0 | 259.0 | 244 |
| | Total ... ... | 328.7 | 373.8 | 363.2 | 417.0 | 428.4 | 479.0 | 391.8 | 364.9 | 354.0 | 265 |
| **Tin** | U.S. ... ... | 14.8 | 12.0 | 33.6 | 32.4 | 30.9 | 33.0 | 28.2 | 24.3 | 27.0 | (22) |
| | O.E.E.C. ... | (10.0) | 10.5 | 6.8 | 5.4 | 5.5 | 5.8 | 4.9 | 6.5 | 24.2 | 20 |
| | Total ... ... | 24.8 | 22.5 | 40.4 | 37.8 | 36.4 | 38.8 | 33.1 | 30.8 | 51.2 | 42 |

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[1] U.K., France, Germany, B.L.E.U., Netherlands, Italy and Sweden.

[2] For the figures relating to the first quarter of 1954, full data was available at the time of writing for the U.S. and all the seven O.E.E.C. countries except the Belgium-Luxemburg Economic Union and Italy, for which countries data for January and February only were available. *Sources* : U.S.—Survey of Current Business ; *U.N.O.*, ' Commodity Trade Statistics ' ; *O.E.E.C.* Statistical Bulletins, Foreign Trade,'. Series IV.

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